REPORT

OF THE

INSPECTOR OF MINES,

COUNTY OF SCHUYLKILL,

1869.

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REPORT

OF THE

INSPECTOR OF MINES,

OF THE

COUNTY OF SCHUYLKILL,

FOR THE

Year ending December 31, 1869.

HARRISBURG:
B. SINGERLY, STATE PRINTER
1870.

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COMMUNICATION.

To His Excellency, JOHN W. GEARY,
Governor of the Commonwealth of Pennsylvania:

SIR:—In compliance with the requirements of law for the better regulation and ventilation of mines, and for the protection of the lives of the miners, in the county Schuylkill, I have the honor to submit herewith the inspector's report of the condition of said mines when inspected; the modes used and manner of ventilation of shafts, slopes and drifts in operation; their depths, lengths and section areas, and shipping capacity; the number and power of steam engines and steam boilers and their condition; of the number of persons employed in and about the mines, those that were killed, maimed and injured; of widows and orphans; of steam fans and safety escape roads out of each mine; the motion of the air, and estimated quantum of noxious gas in each, and comparison of temperatures; names, locations, land-owners and operators of collieries; with tables and subjects relating to mines, safety lamps, gases and fans, with interesting gas and lamp tests in England, and our remarks on the condition, and the reforms recommended, etc., for the nine months ending December 31, A. D. 1869.

Very respectfully, your obedient servant,

JOHN ELTRINGHAM,
Inspector of Mines of Schuylkill co., Pa.

Attest:—P. F. M'ANDREWS,
Assistant and Clerk.

REPORT.

To the Senate and House of Representatives of the Commonwealth of Pennsylvania:

GENTLEMEN:—In presenting the annual report in compliance with the requirements of law, for the better regulation and ventilation of mines and for the protection of the lives of miners in the county of Schuylkill, it affords me the highest gratification to present to you, and through you the people of the county, the substantial proofs which the year's labors furnish, going to show that the law for a proper ventilation of mines, and a public investigation of their condition in this conuty, is rapidly coming into favor with the masses of the people. Although we are not at all free from perils and dangers in discharging our duty, as it was eminently necessary to approach every possible danger that imperilled the life of the miner, and to investigate the cause and determine its locality and magnitude, and to recommend suitable remedies for its removal and security,

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many of which, indeed, existed in the early part of our tour, and still a few exist, and have with a degree of truth being complained of; but it is gratifying to know that improvements are taking place as rapidly and as satisfactorily as circumstances will admit. Most all operators cheerfully concur and promise to carry out the proposed reforms as soon as favorable opportunities occur, and then to do so to satisfaction; whilst a disposition of moderation and forbearance on part of the miners, in making due allowance for the time required for such changes to be made, is very commendable.

I regret the report on mortality, arising from injuries and accidents in and about the mines, for the nine months ending December 31, 1869, is much larger than was anticipated. The fearful number of persons killed, amounts to 56; of injured, 86; of widows, 30; of orphans, about 150. Of the injured, over one-half are maimed for life Some of these casualties have arisen from want of due caution, in not securing the working places in the mines; and more from carelessness, hurry, and a lack of judgment in the art of mining, etc., etc.; which the statements hereto annexed will explain.

When we compare the very large number of persons employed in the coal mines of our county, amounting to some 22,000 persons, and the unorganized manner in which many of those mines were managed, it is not to be wondered the casualties are so great.

The rules and regulations we recommend for the better regulation and vintilation of mines, and for the protection of the lives of the miners, under the law for that purpose, is carefully and impartially given. The qualifications of officers in charge of inside and outside departments of mines are carefully inquired into, and if found incompetent, their removal demanded. Deputies, appointed by the miners of each colliery, are always invited to accompany us on our tour of inspection in any mine, together with the mining boss and his firemen; all of whom are respectfully requested true answers to make to all such questions bearing on the condition of the mines, or affecting the interest of the miners, whilst all bear witness to the reforms recommended.

It would seem proper, in view of a general desire for information in relation to the condition and ventilation of mines, and the interest manifested in the protection of the lives of the miners, under the beneficent provisions of the new law, that a synopsis of the result of our investigations should be herein set forth, and be made known to a proper extent; and in doing so, have a proper regard for the interests of all. With this view, the interest publicly manifested in the department of mining induces me to furnish the Legislature a candid detailed statement of the condition of each mine, of its inside extent, its workings, air-courses and the manner in which it is ventilated, its engines, machinery, condition and capacity, as it presented at the time such collieries were inspected. It is proper to state, that the new collieries that have been established these last few years are regarding a proper system of mining, having in view durability and economy; whilst the old mines were worked with less care, and poor judgment, that they now become expensive to manage, and only receptacles for gas and water.

Since steam became a medium in developing coal in this county, the deep shafts have successfully proved the large fields of coal that underlie each other; yet the mining of such coal is exceedingly expensive, requiring monster steam pumps for drainage, and all other engines in proportion to the magnitude of the mine. The Beadle steam fan ventilator is the next great auxiliary in mining, and a proper application of this fan will insure success. Presuming we cannot do this subject that justice it demands at

our hands, in a more complete form of details, we have attempted at least to furnish plain statements of facts, having no other purpose in view than the interest of the public and a desire to remedy evils that were very truthfully complained of. Whilst it may want completeness in some of its details, fail of that minute accuracy in its statements it is hoped will not at all be deficient, and may be relied on as being substantially correct, and entitled to confidence, though in some few instances we are not favored with correct statements of some few collieries as we would wish by those in charge, which appear to be mere strangers to the history of the mines they undertake to manage.

Of those collieries which directly claimed our attention, and in most part have completed the reforms recommended, there is still room for improvements; whilst some few are slower, owing to inconvenience than is desirable; whilst all are advancing in improvement. Powder smoke is a grievous annoyance in many mines, of which the miners truthfully complain, which would not be the case were proper air courses resorted to, and yet the expenditure would be none the greater. There are obstacles which often insinuate and retard reforms in many of the mines, owing to the clumsy manner in which they were mined formerly, and from such cause have fallen in and closed every channel of ventilation. There are some drift collieries that have no gas of any account, the mining of which is carried on without resorting to any correct system of ventilation, and here smoke prevails largely, owing to the influence of the atmosphere. Others again resort to furnaces and air stacks, all of which are unfit, unless at great cost, to ventilate a mine properly; the consequent results of such ventilation is an injury to all parties, a diminished depreciation of the value of the property, and a great loss of coal to the land owner, a pecuniary loss to the operator, and a loss of employment to the people at large.

Any one conversant with the mining operations of this region, knows that in very many instances collieries are so operated, that as much as one-half the coal in some mines is left buried up never to be recovered, and that such is a total loss to all concerned. This is frequently the result of unskillful knowledge on the part of the managers, often of recklessness occasioned by necessary embarrassment, sometimes by a desire to take advantage of momentary high markets to make most money by large increase of shipments. But from whatever cause, it is a permanent injury to the community, although in rare instances, the party perpetrating the wrong may reap a transient advantage.

The injury to the land owner and coal is very obvious to the operator or lessee, it is although more remotely likewise an injury, for although he may temporarily increase his shipments and make large profits, yet by a course of recklessness in mining his colliery, it becomes in such a condition that in almost every case his subsequent expenditure, in the futile endeavor to repair his mine, will be found largely to overbalance any profits he may have received. He will also sustain a loss by the diminished value of his improvements, resulting from a less amount of coal being mined than he has the capacity to prepare over them.

But to the laboring miner a very great injury results. He who, calculating on the permanency of the colliery by proper management of the mines, has invested his savings in the purchase of a home for himself and his family, in the locality where he would naturally expect his labors to continue, by improper management, finds the work that would have continued twenty or thirty years, abandoned in eight or ten, and the operation transferred to another locality. From this cause his property is diminished one-half, frequently even to a nominal value.

This is not a fancy sketch you well know. New Philadelphia, Middleport, Patterson, Tuscarora, the Delaware and Swatara, and other mining towns in the county are melancholy examples. Hence results the unsettled condition of our mining population, inducing reckless habits and terminating in wrong doings, in which the coal region abroad has, with some degree of truth, being frequently complained.

The consumers of coal are also affected, for, as the miner has to penetrate deeper and deeper into the earth, as the coal is extracted out of greater depths, the cost of production is increased and the price must be enhanced. This matter has been understood in England and other mining countries, and most stringent provisions have been made by law to prevent what is there universally regarded as a great public injury.

They have gone much farther there than would be practicable or desirable for us. I think it was John Stewart Mill who lately introduced or advocated a law regulating the amount of coal to be consumed by families and workshops, by limiting the size of furnaces and other means of consumption.

When we reflect that we have much less of *Anthracite* than they have of *Bituminous* coal in England, it seems time that some action should be taken in the business by us. The proposition made is a very mild one, amounting to nothing more than the giving information by the State authorities to the owner, of the probability of a loss of his property and leaving a prevention of it to his own sense of advantage. This feature seems not to be objectionable to any one when coupled with the measure introduced.

By reasonable discrimination made to lessees of collieries, where the coal has to be extracted at great depths, and under local disadvantages, in order to secure to him a reasonable remuneration for his investments, which are often hazardous, and to enable him to improve the condition and stability of the mines, and to provide proper means of ingress and egress, and a thorough plan for ventilation and for the safety of the lives of the miners in the deep mines in this county, that he might be able, with some degree of credit, to deal in fairness with the miners under him. Those who have their lives and the interest of their families in constant jeopardy, and too frequently sacrificed in mines that are not kept in proper condition, and who, by the force of necessity, are compelled to resort to them for a living, and knowing them to be such. The benefit resulting to the miners from hard toil and harder bargains, the loss of time, etc., is scarcely remunerative, and many of them, from age, disease and injuries, are in needy circumstances, never receiving that sort of encouragement or sympathy as that class of our citizens should expect.

Thus, then, these three interests, the land owner, operator and miners, are suffered to remain at variance, whilst no intervening measures are taken to reconcile or harmonize them, and are, as all know, subjected to every sort of outside influence that operates sorely against the commercial coal interests of our county, in the form of corporated coal companies of sister counties, auction coal sale, brokerage and excessive tolls, coupled with this the enormous amount of capital it requires to develope deep mines, by deep slopes or shafts, expensive buildings, pumps, engines, and the necessary machinery, besides the great loss of coal in its preparation for market. That in the absence of proper measures for the relief of these interests, there will be a constant resort to injurious means to produce coal, and undoubtedly the anthracite coal interests of our noble State will suffer.

In connection with this subject, I would beg leave to say a word on the subject of gases. It was formerly supposed that gas was an element, and was not altogether regarded as a material substance, but was regarded by

some old philosophers as a similitude to that of light, heat and electricity; a fluid substance, without light, form, weight, heat, color, or any of the ordinary forms of matter. In 1673, some persons supposed that other airs than atmospheric airs did exist; and at that time one Robert Boyle, an Englishman and chemist, maintained that some solid bodies do, in certain circumstances, as, when heated, throw out artificial airs resembling atmospheric airs in thinness and elasticity; but, while differing in his opinion, he still could not explain how. But about 1700, some miners in a Prussian mine were so much annoyed by and suffered from the influence of certain airs, some of which were liable to suffocate, silently but so surely, whilst other airs exploded. The cause of this phenomena could not be determined. Those airs were called choak-damp (carbonic acid gas) and fire damp, (carburated acid gas.) Some chemists endeavored to explain this wonder in nature, of being the agencies of guardian spirits of these mines, and gave it the appellation of ghost winds; and from this originated the common name of gas, which still retains to designate areoferous substances. Torrecilli, a pupil of Galileo, in 1643, first proved that atmospheric airs possessed weight; and in 1757, James Black, a Scotchman and chemist of Edinburg, collected other airs, other than atmospheric air, that animation could not exist, breathe or live in. This is what we now call carbonic acid gas, and Mr. Black termed it fixed airs, owing to it being fixed or imprisoned in the solid, until extricated from its fixed state by heat. This was a triumph in chemistry, since, for the first time, it proves clearly that different airs exist as often as there are different substances. Solids or fluids produce different airs, as sulphur differs from water, or slate, marble, lime, and sandstone and shells.

Dr. Priestly collected and rendered easy the handling of gases and gaseous substances. He also isolated different sorts of gases, and among them oxygen gas. A Mr. Sheele, a native of Sweden, discovered three more gases, and discoveries followed in rapid succession all over Europe. Mr. Cavendish found hydrogen gas; Mr. Rutherford found nitrogen; while Mons. Lavisior overthrew all opinions, by proving that it consisted only of two gases, mingled in unequal proportions. But a recent discovery proves, and it has been admitted as a fundamental principle in physical science, that gases are merely steam, which boil at immensely low temperatures, these liquids being the liquifaction of solids which liquify at still lower temperatures; and that, therefore, there may be still no limit to the number of gaseous matter, precisely as there is no limit to the vast number of solids and liquids. Pure atmospheric air consists essentially of nitrogen and oxygen, in $\frac{4}{5}$ths proportion in volume of the former to $\frac{1}{5}$th of the latter, and, when freed from all foreign matter, weighs, nitrogen by weight, 76.90, and by measure, 79.10; whilst oxygen by weight, 23.10, and by measure, 20.90; and in addition, atmospheric air contains a small portion of carbonic acid gas and aqueous vapor, portions of ammonia, nitric acid and aroma of organ and in organic matter in that. As the oceans contain traces of almost everything that is soluble, so the air contains traces of everything that is volatile. The oxygen and nitrogen that exist in the air are merely mingled, not chemically combined with each other, but their relative properties never vary. This is proved by airs collected at different elevations. Carbonic acid, being much influenced by local causes, varies considerably, being $\frac{4}{5}$ths volumes in 10,000 volumes, its proportion being greater near the earth in summer than in winter, and during night than day; is more in volume in high mountains than in valleys, owing to a continual absorbtion of herbage, which absorbs an enormous quantity of carbonic acid gas, which is discharged in large quantities from the summits

of mountains and volcanoes. In the upper air it may be easily detected in rain water after a thunder storm, chiefly owing to the presence of electricity, and is supposed to be a union of oxygen and nitrogen. The presence of these gases can often be detected in the mines by the sense of smell, and a peculiar effect in the system gives abundant evidence of its presence. This is especially true of the odoriferous and miasmatic effluvia in our coal mines, and the peculiar smell of the sluggish airs in them, as abrood in marshy and swampy places, and the deadly effect it has on vegetable matter, in most climates, on animal as well as vegetable life, causing incurable fevers and agues in the Caucassian race. The African race seem to possess a certain humidity in their constitutions which dilutes the power of this deadly gas. The office of the nitrogen in the air, then, is to dilute the oxygen when it increases beyond its due proportion, and check its inflammability, and destroy its functions of life and force, and exhausts its power.

Nitrogen being the most indifferent of all known substances, and wanting in any poisonous qualities, dilutes the too active oxygen and prolongs its action on the substances in the same manner that water dilutes spirituous liquors. Is has been proven that nitrogen of the air discharges an important office in respiration, by preserving the volume of tension of the cells and the extreme tubes of the lungs Moaltric oxygen is strikingly magnetic, and nitrogen singularly the reverse. The atmosphere is a mixture of both ; is nearly neutral as respects magnetism in all its relations to matter.

Both these gases are common in a great many of our mines, and when permitted to increase in volume, is surely to result in loss of life, and up to a very late period, very little has been done to remove their influence from our mines; not till the happy idea of Mr. Louden Beadle, who invented the steam fan ventilator, that those gases could be coped with, and we still find those who, from ignorance or prejudice, resist their introduction in mines, when such persons have the management.

Carbonic acid being always present in the air and water of our mines, is ever ready to seize on free bases; its union with mineral salts is weak, owing to its elasticity, tending to escape in the condition of gas, it is expelled from its combinations by most other acids, a property which always distinguishes carbonates. The volatile gas or carburated hydrogen is the most abundant gas in our mines, and is found in some as high as 25 per cent. of the volume of the air within, which fact loudly calls for proper remedies for the protection of those who, by force of circumstances, are driven to seek employment in such places, yet aware of the terrible situation they occupy.

STEAM FAN VENTILATOR.

Mr. Louden Beadle claims this invention. It is based on the same principle of a common farm fan, moved by steam engines placed on the upcast air shaft, and when put in motion, draws the air in at the side draw-hole and throws it off by the force of its paddles. A 14 feet diameter fan of 6 paddles, each 16 square feet, at 130 revolutions per minute, was found to displace 18,137 cubic feet of air from a mine, where the average per cent. of gas in the mine was 25 per cent. of the volume, and mining the coal was conducted under its influence with safety. The gangways are set off in sections with check doors placed in them, which acts like great valves to admit the passage of trains, &c., and attended by boys. All the schutes and air-courses are subjected to close plank batteries, which turns the air into it proper district. The action of the steam fan, when in motion, is perceptible in any

part of the mine, as the motion of the air will indicate the speed at which the fan is running. The fears and frettings of the miners in their operations is lessened, as smoke and gas is removed, and by that means are enabled to examine the surrounding more clearly, and be better able to protect themselves from impending dangers of coal or rock.

The furnace system of ventilation is in use in England a long time, and that government has made stringent laws for their management, and the mining of coal generally, whilst none but persons of approved practical ability are permitted to manage a mine, and each employee is handed a printed copy of the rules and regulations of the mine, and is examined in the same first before he be admitted, and then keep within the limits prescribed for him, under a penalty of fine and forfeiture. The steam fan is coming into rapid use and great favor in England, and is bound to supersede any other plan of ventilation. as being the most reliable system of safe ventilation yet discovered. So that to construct a fan on this principle, it is eminently necessary to have them securely fitted, and accurately measured to insure succe s, and all approaches carefully closed, and sliding doors fitted so as to regulate the draft as required. One of the best constructed steam fans of this class has been erected by the Messrs. Bancroft, Lewis & Co., at their Pioneer colliery, Ashland. It is walled in and under the surface, in solid mason work, well laid in cement; this is done to avoid all leakage of surface air; the paddles are securely covered with sheet plank, closely fitting the paddles, so that all the air drawn up from the mine is effectually discharged and freed from fouling in the paddles, as some fans of a different sort will do from the open manner of their construction.

There are other steam ventilators built on a different principle, erected entirely above the surface, and the paddles working in an open space, exposed to the weather on all sides, and some theorists say this class of ventilators are as effectual in their operation as those covered in and under the surface. There are other ventilators erected at the bottom of the shaft, within the mine, at a great depth below the surface, some six to seven hundred feet, receiving steam from the boilers on the surface through a column laid down the air shaft. There are many objections to this sort of ventilators, as being too remote from the point at which they might be more effective, and much less liable to derangement by being placed near the surface, as the lighter air is always seeking the highest point, and their repairs and attendance more likely be cared for according to the following, which has been selected from the last reports of the London Mining Journal:

THE GUIBAL FAN.

The air pit near the upper coal pit has erected on it two of those fans, side by side, for the ventilation of both mines; they are 30 feet in diameter and 10 feet wide; each is driven by a direct acting steam engine having a vertical cylinder, going at the rate of 65 strokes per minute. All Guibal's fans are provided with a cover and an adjustable slide for regulating the egress of air into the stack; the latter is made to expand upwards. By these means 60 per cent. of the steam power used is utilized in the ventilation, and the machine is simple in its construction, rendering it liable to derangement in the smallest degree. The quantity of air obtained with one fan going at the rate named, is stated to be 120,000 cubic feet per minute; when both fans are working together the quantity obtained is about 20,000 cubic feet more, under the same conditions; this is explained by the fans being too near, one interfering with the working of the other; and, also, they do not show such good results above a certain limit of pressure,

as indicated by water gauge, as a piston machine would do. In the latter case an increase in the size of air-ways would be required to diminish the friction and drag in the mine. The useful effect obtained from the Waddel fan is open at the circumference. The Guibal fan utilizes 60 per cent. of the steam power, compared with a furnace at the depth of 500 yards. The saving in fuel is in favor of Guibal fan, is stated by the inventor to be 50 per cent. Fans of this construction are now at work in England 36 feet in diameter and 12 feet wide, one in Belgium is of 40 feet diameter, so that when other advantages in favor of fans, as contrasted with furnaces, are taken into account, there is little doubt of the Guibal fan, more particularly, being extensively adopted for the ventilation of deep mines.

STRUVE'S VENTILATOR.

Several of these machines are in operation in South Wales, one at Pyle, Crom Avon, New Tredegar, and at Lletty Shenken colliery, near Aberdare. The machine erected at Lletty Shenken has two air cylinders of 18 feet diameter and 7 feet stroke. Each cylinder made of $\frac{1}{3}$ inch iron, weighs $6\frac{1}{2}$ tons, and works up and down in water between two concentric cylinders 20 inches apart. There is a cover placed over the moving air cylinder, which makes the machine double acting, drawing and expelling air both at the up and down stroke. The contents of one cylinder inside, with 7 feet stroke, are 1,780 cubic feet. This quantity expelled twice during the up and down strokes gives 3,560 cubic feet, with 8 strokes per minute the quantity would be 28,480, and with two such cylinders 56,960 cubic feet per minute. The quantity of air actually got into the mine is said to be 49,000 cubic feet, with the machine going 9 strokes. To each air cylinder there are 192 valves, 21 inches by 12 inches, or 96 inlet and 96 outlet valves. The area of 96 valves together is 168 feet, and of the top of the piston or air cylinder 254 feet. The machine can be worked up to 13 strokes per minute on an emergency, which would give 70,772 cubic feet of air. The machine is driven by a steam engine two 15 inch horizontal cylinders, 22 inch stroke, motion reduced 4 to 1. From the crank shaft motion is given to two beams, the working air cylinders being attached to one end of each, and the connecting rod, with weights to balance the cylinders, are fixed at the other end of each beam, giving the machine, as a whole, a clumsy appearance. The arrangement could be simplified by placing over each air cylinder a steam cylinder, working direct to the former, and at a greater velocity, at 12 strokes and upwards per minute. The air cylinders might be made of wood, which would relieve the engine of the dead weight of the iron cylinder and be more durable; the iron corrodes rapidly in the mineral water; 45 per cent. of useful effect is stated to be obtained from these machines on the steam power used.

From these observations, we conclude that there is a great saving of fuel when ventilating machines are adopted. They are much more safe than furnaces, and will often save the cost entailed by delays and accidents; and in practice large quantities of air are obtained, with them meeting the requirements of extensive mines, and greatly adds to the healthfulness of the mines. Coal should be worked on a systematic plan, from maps made by competent mining engineers of the coal veins to be worked, leaving sufficient strength to support in every emergency, where the accidental disturbances of the stratas did not interfere with the workings of such plans, and the utmost attention given to the location of air courses and air shafts, to traveling roads for men, to retreat roads in cases of danger for the safety of men, and special attention given to the proper drainage of all the

different levels. As there are at present in our mines some very large bodies of standing water in the upper abandoned works, which would inundate the whole lower mines, if from the accidental explosion of large bodies of gas, or the too great reduction of the pillars or upper supports of the old works took place. It is hoped the wisdom of our State Legislature will meet the requirements of this case fully, as the daming up of large bodies of water in the upper abandoned and dilapidated parts of the mines, causing a constant decay and rot of matter generally, should be as much dreaded as choke-damp or explosive gas. In mines where engines could be used for under-ground hauling, much advantage and saving would result from their use, if made to work by compressed air, and making them portable and capable to move at pleasure, at as little cost as possible.

SAFETY LAMPS.

October 1, 1869, experiments were conducted at Heaton colliery, in England, with safety lamps, which were interesting. For a long time it was considered that the lamps in common use were unsafe; it was therefore concluded there was only a slight point of difference where safety actually existed and danger was possible.

To begin with the Davy lamp, which was the very first lamp ever invented for safety in mines where inflammable gas existed, and to prove its volume and density, it was shown by this experiment, that it would explode in a current moving at the speed of 8 feet per second. It is therefore evident, from the long practice and extensive use made of the Davy lamp, that explosions very rarely occur by its use if properly used. The most extensive practice proves this, and it is quite clear when we consider that to get an inflammable current of sufficient speed to explode from an ordinary Davy lamp, requires a great discharge of gas, and at the same time a rapid motion of air. The tests applied to the Davy, Stephenson and Gray's Clanny lamps, resulted as follows: At the former trials, the Stephenson, according to the published accounts, exploded in the current of air varying from 10 to 13 feet per second, but as will be seen, it stood at the late trials a speed of 25 feet per second, although it did ultimately explode at that speed. And Gray's Clanny lamp also appears to be an excellent lamp, as it stood all the tests applied to it. The Hann lamp stood all the tests; of its use we cannot speak for it, as having never used it. These experiments ought to receive great consideration, as being highly instructive and interesting to all who are employed in mining business.

Some writer undertakes to say that taking an ordinary air course, having a section area of 30 square feet and to have 6,000 cubic feet per minute, it requires 700 cubic feet of gas per minute to be generated to produce an explosive current of air, but as he makes the speed of the air only 3.33 feet per second, the condition of danger is not imminent; when in a mine is it likely that these conditions are likely to arise? It will require an immense quantity of air and a great discharge of gas to produce those conditions. Taking a common air course as before, it will require a speed of 8 feet per second, or 14,000 cubic feet of air per minute, and a discharge of 2,000 feet of gas, and these circumstances are not likely to occur. They have very rarely occurred; of that we may be assured, for the conditions necessary to produce an explosion must be pretty closely fulfilled, otherwise there will be no explosion.

The writer says, a very large quantity of gas, as compared with any known currents, would have the effect of extinguishing the lamps, and as yet only spoken of district currents, but taking a main current, when

30,000 cubic feet of air pass per minute, and the section area of the air course is 54 square feet, having a speed of 9 feet per minute, and 3,000 cubic feet of gas per minute is required to produce an inflammable current, and this is a circumstance unlikely to occur. Taking into account the possibility of a blower of gas acting direct on a Davy lamp, although such a circumstance might possibly occur, the result of this would very much depend on the discharge. But, speaking from our experience in the mines of England and in Schuylkill county, we know the air courses in the English mines to be large and uniform throughout, but in this county the air courses in most mines are neither uniform or regular, but made to suit a temporary purpose, and not in the least consulting the condition of the air.

The mining district of Schuylkill county lies within the parallels formed by the Sharp mountain on the south, and the boundary lines of the counties of Northumberland, Columbia and Luzerne on the north; on the west by Dauphin, and on the east by Carbon counties; reducing the angle formed by Union township, along its northern line, it takes the form of a parallelogram nearly 39 miles long and 14 broad, of an area of 504 square miles. The southern district, which is bounded by the Sharp and Blue ridges, embraces an area of 256 square miles, and is altogether agricultural. The coal district is traversed by 47 different main and branch line railroads, 32 of which are operated by the Philadelphia and Reading railroad company; one main and three branch lines by the Quakake railroad company; one main and two branch lines by the Western and Erie railroad company; one main and three branch lines by the Lehigh Valley railroad company; one main line by the Lebanon and Pinegrove railroad company; one main line by the New York railroad company to Sunbury, and one other branch line under construction, and the Catawissa railroad; total railoads 47, all of which seem to be in active operation. A number of our collieries are double collieries as working drifts and slopes, and drifts and shafts. The number of railroad cars daily used is 7,820; the capacity of the collieries requires 11,000 railroad cars per day when in full operation. The Philadelphia and Reading railroad furnishes the best facilities for transportation.

The coal veins of the district have their poles east and west, their anticlinal axis dipping north and south at angles varying from 5° to 87°.

The coal fields of the county if formed of a great number of basins, and generally the different veins having their uniform thickness and regularity of formation and universal appearance and texture, with every variety of dip, are to be found in all the basins with scarcely any change in the coal or thickness of the veins, the measures constantly obeying the laws of uniformity, except in the bottoms of some basins the coal sometimes exceeds 100 feet thick. Except where they are confused by local disturbances their condition is still the same.

The gas pervades all the mines to a greater or less degree, varying from 3 per cent. to 25 per cent., and is found to exert its influence in mines over as well as mines under water level. The temperature of the different mines at different depths was found to range from 34° to 108°; the greatest temperature was found at Silver Creek mines, where, at the outcast at the fan, it was 138°, and outside 54°, October 1.

The subject of using steam pumps in deep mines should receive some attention, as it is found from actual experience that steam has a destructive influence on timber, causing a dry rot; that timber that would hold good for fifteen years, is destroyed in three years; besides reducing the condition of the slate to powder. The Bull pump I would prefer to any now in use, as being much less troublesome and easier managed.

I have recommended the best plan in practice for carrying air and

driving air course; pointed out the best locations for steam fans, and the capacity of which they should be made, and how constructed, a great number of which are being put up; and in the course of another year very few mines in the county but will have them in use.

Some mines above water level are so poorly managed, that a person must wade in water their whole length. There is no excuse for this course, and it is an omen of carelessness; such should not be the case, as the destruction to railroad iron must be great.

In many of our mines it becomes necessary to use the safety-lamps only, an instrument which is but imperfectly understood by many persons who are mining. Those lamps require the strictest care to preserve their cleanliness from oil, rust or dirt; it being the only reliable instrument known to the miner in approaching the deadly fire-damp, (carburetted hydrogen,) with an absolute degree of safety, and survey its limits and volume, condition and quality, without any hesitation of fear or danger, when in the hands of the practical miner. But the displacement of a single mesh of the instrument is cause enough to explode it in gas. In the case of an explosion there is nothing secure from the influence of its flames, as there is nothing having air imbibed can resist it, and leaves no vital air behind that animation can exist in. The element left takes the form of choak-damp, (or carbonic acid gas.) It is said that carburetted hydrogen has seven times the force of an equal volume of gun-powder, when in a pure state. But in mines, it is never free from mixtures of atmospheric air and vapor in combination. It is the perilous business of the miners, very frequently, to work in this element, knowing well the dreadful element that surrounds him at his work, and his feeble capacity to cope with it in its inflammable form, besides the danger he has to encounter after an explosion, in the form of choak-damp; that his life depends as much on his fellow-workman's carefulness as on his own; and yet, to see with what degree of carelessness he hurriedly enters the district where death hangs on the smallest spark, and goes about his business as if no such danger ever existed, and often contrary to positive instructions and regulations; thus endangering his very life for the sake of earning a subsistence to maintain his family. The real condition of the miner, when viewed calmly and dispassionately, is indeed claiming sympathy and commiseration of a generous public; whilst it is true that in many of the mines where inflammable gas exists the modes of ventilation are too often insufficient and inadequate to furnish a supply of fresh air, or to remove the deleterious or noxious element, where these poor men have to work in. In most cases the operators are not to blame for this, as the cost of driving small air-courses is as expensive as the large ones, and done much easier. Some mining bosses do this sort of work from habit, and an eye to expense, and a want of judgment of the manner of ventilation in deep mines; and the consequence resulting from such a course eventually cripples the means of production; always resorting to mining in the neighborhood of good air, until these districts are so weakened, that the crushing in of the whole mine is constantly threatened; when the object of the manager should be to extend his openings to the boundary limits of the territory, securing sufficient air-courses all the way, and thus the air-holes to be permanent; then work out the coal as he comes back; always securing the gangways for air and water courses. Any other plan cannot be too severely condemned.

The suffering of too much smoke in any mine is bad policy, as it is very hurtful to health, and hides the surrounding dangers, and a full complement of work cannot be performed; all of which conflicts with the interests of both operators and miners, and frequently is the cause of the loss of many

lives. I have given positive instructions in such cases for their removal, and called the attention of any miner, who may feel it his duty, in my absence, to notify me of any dereliction of duty or unnecessary delays; and when such notice is received, we promptly attend, and examine parties, and hear excuses why it is thus a matter of complaint.

I would beg leave to suggest the propriety of a clause as an amendment to the law for the better regulation and ventilation of mines, and for the protection of the lives of the miners in the county of Schuylkill, that a section be added thereto, requiring all boiler makers within this county, to put boilers for the use of coal work together by no other process than hammered rivets, and not by machine pressure, which raises a swelled flange between the two boiler plates, in which case the seams cannot be so securely staunched as would be by the hammered process, and that no other quality but the best C. H. No. or charcoal boiler iron be used, and not that sort of boiler iron which is found to split under ordinary steam pressure, which blisters and burns and finally explodes. Also, that all boiler makers be required to stamp all steam steel yards or beams and their respective poises, to guard against accidents arising from great pressure; where such contrivances are not attached to boilers, to indicate to the engineman or his fireman, who may be really ignorant of the rules by which to know the pressure of steam on a valve. That a steam indicator be attached to all sets of boilers, and never to suffer extra weight to be placed on any steam beams of boilers under a penalty and forfeiture. As there are many enginemen who undertake to run and control engines, who know very little else than start and stop their engines, and it is often found that too much space is left between the grate bars and boilers; that such space is often unnecessarily filled up with coal, without the least regard to economy, and that such space and unnecessary coaling is an expenditure, and that an engineman and fireman should be competent to judge of coal, of fire, and water sufficient for the purpose; and should so study the profession of an engine man as to fit him for that important profession, as would be fit to be entrusted with the lives of persons who are often compelled to risk their lives at his hands. That he have full control over his engine and machinery, as to be empowered and authorized to prevent the premises to be occupied with idle company night or day; and no engineman who is an habitual tippler, or who may be under the influence of liquor, or be subject to spells of unnatural sickness, be suffered to touch any engine or put it in motion whilst in such a state, or enginemen who are addicted to rashness or irregularity of conduct, all of which may result in loss of life and ruin of property. And that any person violating the rules prescribed by the superintendent, with regard to engines, boiler houses and machinery, unless by obtaining consent from the officer in charge, should be a fineable offence. That in such buildings, engine, breaker, boiler or any houses attached to mines, such heating apparatus should be so safely secured as to be locked, and that the flue, stack or pipe of such stove or contrivance be so safe as to render it harmless. That persons employed as watchmen, who will on any pretence, permit meddlers to trespass on their beat at unlawful hours, or neglect his duty, is unfit to be a watchman, and deserves to be expelled or disgraced, and reprimanded, as by his neglect the lives of persons and loss of property may become involved. And also persons pretending to ventilate mines in any other manner, when such a method is not effecting the correct ventilation of the mine than by the most approved system, he be prohibited forthwith, on complaint of the miners or a majority of them, and required to resort to an approved system of ventilation; and in the event of

a failure on his part to comply with the requirements of law, then his acts to be a fineable offence.

I have ascertained the force of the air-currents in a number of mines, and found, by actual measurement, that these currents range from two to 24 times too slow. The reasons for this are obvious: the air-courses being too narrow, too much leakage of air, and a want of sufficient check-doors on the gangways to force the air forward; though many of these mines have steam fans in use that as well might have none at all, as they are quite insufficient to perform the work required of them. We, too, find many excellent engines and machinery that are badly handled by the engine-men. Of this class I have made a discrimination of first and second class enginemen, who should be entitled to receive a county certificate of qualification for their profession and industry. Any other persons under the second class are not noticed until they, by experience and industry, arrive at class No. 2. The wire ropes, too, require very constant attention, as much interest is depending on their goodness; and if found lacking in any particular, they must be removed. I would recommend for their lubrication any good linseed oil, with a very little pine tar. I have especially inquired into the condition, age, defects, and every minutiæ, and required the strictest care to be constantly given to boilers, valves, and water gauges. The steelyard should be stamped.

Having examined the breaker-buildings, their machinery, and the possibility of accidents to persons from unprotected wheels, pulleys, shaftings, screens and beltings, and any other thing that might endanger life or limb; and any where such defects had been met with, positively directed their security, as a great number of children are in jeopardy of life and limb for want of such precaution.

The law for the better regulation and ventilation of mines, and for the protection of the lives of the miners, in Schuylkill county, has indeed wrought very many beneficial reforms, as the lives and interest of the miners are much better cared for, and the property intrusted to the managers of mines receives better attention, and a general desire of security is gaining ground. The very remarkably settled state of society, which is developed under the new institution of the Workingman's Benevolent Association, and the operators' committee, is bringing about very beneficial results—a blessing the county never enjoyed before. It is hoped that the counsel of good and true man will prevail, and gain a lasting friendship in the hearts of all our people, and that violence and crime will be driven from every good man's door.

Our people should in gratitude return their thanks to our Governor and State Legislature for that beneficent law they in their wisdom granted our people, for their special protection and security, which has extended its influence over persons and property alike; and especially to Hon. William M. Randall, of the State Senate, to Decatur E. Nice, Phillip Breen and Michael Beard, of the Assembly, for their untiring solicitude in obtaining the friendly offices of the legislators of the State, to provide our people with such protection. The benefits which result from its influence have won for it the gratitude and admiration of every thinking man, and all classes of society.

In obedience to the Divine will, we should bow before and thank Almighty God for the blessings of prosperity and the marked harmony evinced amongst the people, believing the great cause of our prosperity lies at the foundation of our protection, and the good work that has began may still continue, thanking God for the progress of the past, and resolve to labor with

more zeal and earnestness and devotion in the future, to know and regard one another as of one family only, and citizens worthy of our great nation.

For ourselves, as mere strangers to all, we must only say, that in discharging our duties, we have done so honestly and without prejudice, to the best of our ability. Avoiding giving offence to none, and hoping no man has reason to have aught against us. Numerous were the difficulties which had to be overcome, but was always met in a spirit of kindness and moderation, which was, we believe, the most proper means to resort to, but if this means failed to have an effect, then it was met with frankness and resolution.

We are thankful to the miners and officers of mines for the many marks of kindness rendered us in our tours of inspection, in affording us all sorts of facilities and information necessary. With marked deference we thank the delegates appointed by the miners who accompanied us in the different mines, for their good offices and conduct, in discharging the duties intrusted to them. We believe they have worked for the general good of all.

We deplore the loss of so many brave miners and fellow workmen, who, under the Providence of God had lost their lives this season, and the great grief it brings to the hearts of so many dear ones, depending on their earnings, and now, by reason of such misfortunes, are subject to the commiseration of the public. The large number of injured and maimed are to be deplored, and their condition needs the friendly consideration of the Legislature, as I know from my knowledge of their circumstances, that they must become wards of the county. Many medical gentlemen can attest, many of which do their duties without any visible sign of remuneration.

Of the number of collieries that have been visited, there are 19,884 persons employed; 12 more collieries to be visited, employs some 1,700 persons, and 24 land sale drifts, supplying towns and villages, employ about 500 more. The aggregate number of persons employed is 22,084 persons. Of this number, 5,500 are boys from 7 to 16 years of age. 56 persons were killed since the 7th of May last; 91 persons maimed and injured, leaving 30 widows and 150 orphans. Of the killed, 22 were by falls of coal, 1 by fall of rocks, 13 by falling in shafts and slopes, 4 by falling in screens, rolls and beltings, 2 by explosions of gas, 9 by explosions of powder, and 5 by sundry accidents. Of the 91 persons maimed and injured, 21 were by falls of coal, 3 by falls of rocks, 2 by screens and rolls, 3 by falls in slopes and shafts, 36 by explosions of gas, 10 by explosions of powder and 16 by other causes. 213 visits of inspection made; 7,816 miles traveled, of which 3,162 miles were by rail and 4,654 by pike roads; 639 miles of which were traversed in mines. 2,343 hours on duty; average hours per day $11\frac{1}{2}$, is equal to 245 days of 10 hours per day. 40 furnaces, 59 steam fans, 450 engines of 24,331 horse power, 1,157 steam boilers, 33,187 feet long, 16,309 square feet grate surface, 161,768 feet wire ropes, 23,710 feet of chains, with all other mining tackle and machinery; 17 shafts, 96 drifts and 111 slopes have been inspected. For every 394 persons employed, 1 person got killed; for every 243 persons employed, 1 person got injured; one widow for every 736 employed; one orphan for every 147 persons employed. 4,688,904 tons of coal mined; for each 81,944 tons a person got killed; for each 51,526 tons one person injured; one widow for each 156,296 tons; one orphan for each 31,259 tons. 1,812 head of mules in use; 6,551 mine wagons, 299 safety escape roads for egress and ingress.

Casualties to Buildings.—Three engine houses and one breaker destroyed by fire; one slope closed in, no persons perished thereby; of gas, (black damp,) percentage from 3 to 16; of carburetted hydrogen gas, 3 to 25; of acidulated sulphur water, 5 to 15 per cent.

A LIST OF MORTALITY *in and about the mines of the county of Schuylkill, for the nine months ending December* 31, *A. D.* 1869.

P. F. M'ANDREW, *Clerk.*

Date. 1869.	Names of persons killed.	Names of collieries where killed at.	Manner and cause of death.
May 7,	John Glinn	Plank Bridge.....	Fall of coal in the mines.
May 24,	John Maley	Glen Carbon Slope...	Log rolling on his head.
June 15,	Ellis Johnson.....	Wadesville Shaft.	Fall of 102 feet in the shaft.
June 16,	John Thomas.....	Plank Bridge.....	Fall of coal in the mines.
June 16,	James Burke.....	Furnace Mines.....	Fall of coal in the gangway.
June 16,	David Jones.	Glen Carbon	Fell in the screens at breaker.
June 25.	Thomas Johnson	Plank Bridge.....	Coal rolling on him in mines.
July 2,	John Clark.....	Glen Carbon	Fall of coal in the mines.
July 2,	John Brown	Otto White Ash	.....do.....do.
July 3,	Thomas Russell..	Hill & Harris's	.....do .....do.
July 2,	George Dutchell	Glen Carbon	Fall of coal—lost a leg—died 26th.
July 10,	Wm. Clark.....	Eagle Hill	Fell 100 feet down the shaft.
July 10,	John Delaney.....	...do.....do	Fell 100 feet down this shaft.
July 12,	George Gallaher,	East Mt. Laffey.....	Fall of coal in the mines.
July 16,	Wm. Ulrick, Sr..	Near Ashland.....	Explosion of powder in mines.
July 16,	Wm. Ulrick, Jr..	...do .....do.....	..... do.....do.....do.
July 22,	Nicholas Harris..	Focht's Mines.....	Rupture in pushing wagons.
July 24,	William Long....	Fowler's Slope.....	Crushed by a fall of coal.
July 26,	Peter Conahan...	Whitstone & Wood's	Crushed in the pump bob pit.
July 27,	John M'Nulty....	Silver Brook	Fell off cage in shaft.
July 30,	Daniel Woodnall	M'Neal's Slope	Fall of coal in the mines.
July 30,	Patrick Murphy	Glenville Eagle Hill,	Premature explosion of powder.
Aug. 6,	James Keatting..	Wadlinger's.....	Expl'n of gas and powder in mines.
Aug. 13,	James Conner....	Hickory Colliery.....	Fell 50 feet from breaker window.
Aug. 13,	Jacob Schwartz..	Cameron	Fall of rocks in the mines.
Aug. 16,	John E. Wood...	Hill & Harris's.....	Caught in belts and crushed.
Aug. 17,	William Walters	Brookside.....	.....do .....do. .....do.
Aug. 21,	Michael Duggan	Glen Carbon	Fell in slope by the rope breaking.
Aug. 24,	Thos. Bradberry	Whitstone & Wood's	Premature explosion of powder.
Sept. 1,	David Davis	Union Colliery.....	Fall of coal in the mines. [deg. dip.
Sept. 7,	Patrick Coyne...	Ostirman's Colliery..	Fell in counter schute 150 ft. @ 85
Sept. 8,	Wm. Kavanagh.	.....do.....do.....	Fell off cage in slope by slipping.
Sept. 10,	Mat'w Donohoe..	Bethlehem....do.....	Fall of coal while resting.
Sept. 20,	Richard Barrett,	Shenannoah Colliery	Fall of coal in the mines.
Sept, 20,	Robert Finley.....	Swatara.....do.	Fell into rollers at breaker.
Sept. 24,	Jos. Dettyonge...	Eagle.....do.....	Fall of coal in the mines.
Sept. 30,	Philip Tullis.....	Chuyler .....do	Slow blast in the mines.
Oct. 2,	Philip Voules.....	.....do..... .....do.....	Premature disch'ge of blast. [way.
Oct. 15,	James O'Brien...	Silliman's .....do.....	Piece coal from blast 42 yds. in gang-
Oct. 20,	Wm. Williams...	Glen Carbon...do.....	Fall of coal in the mines.
Oct. 24,	Frank Waters ...	Greenwood.....do.. ...	Explosion of powder—died on 29th.
Oct. 25,	James Courtney,	East Mahanoy do.....	Fall of coal in the mines.
Oct. 28,	Thomas Lewis...	Pine Knot.....do.....	Crushed by the cage in the slope.
Oct. 30,	Robert Rech	Donaldson.....do.....	Crushed between drift wagons.
Oct. 30,	Henry Okeley ...	Maple Dale.....do.....	Fall of top slate in mines.
Nov. 10,	Saml. Westwood	St. Clair .....do.....	Skull crushed by the elevator.
Nov. 18,	M. O'Brien	Taylorville .....do.....	Boiler house falling on him.
Nov. 22,	Jas. M'Donald ...	Lost Creek.....do.....	Crushed betw'n schute and wagons.
Nov. 22,	Jos. M'Donough,	Shenandoah ...do.....	Run over by wagons in mines.
Dec. 1,	Wm. O'Neil.....	Pine Knot .....do.....	Explosion of powder in mines.
Dec. 11,	Robert Patereck	Maple Dale.....do.....	Run over by wagon in mines.
Dec. 13,	Wm. Williams...	Mine Hill Gap..do.....	Explosion of gas in mines.
Dec. 14,	John Bird.....	Gilberton . .....do.....	Fell in slope, log overbalance cage.
Dec. 14,	John Fellows	. do ....do	..... do .....do.. .....do..a comrade.

56 persons killed.

Of the above named persons that were killed, 22 were killed by falls of coal; 1 was killed by fall of rocks; 13 were killed by falls in slopes shafts and crushed in them; 4 were killed by falls in rollers and caught in screens; 2 were killed by explosions of gas in the mines; 9 were killed by explosions of powder in the mines; 5 were killed by various sorts of accidents; total killed 56, leaving 30 widows; average number of orphans, about 150.

A LIST OF PERSONS *maimed and injured in and about the mines of Schuylkill county, for the nine months ending December* 31, *A. D.* 1869.

Date. 1869.	Persons' names.	Locations where injured.	How injured.
May 7,	John Connelly....	Plank Bridge.....	Fall of coal in the mines.
June 11,	Henry Boyle.....	Peach Mountain	Crushed—run over in slope.
June 28.	Robert Hardy.....	Glen Carbon.....	Fall of coal in the mines.
June 28,	Frank Quinn.....	Boylen's Colliery	.....do.....do.
June 28.	Patr'k Flanagan,	Maple Dale Colliery	.....do.....do.
June 28,	William Porter...	Fowler's.. .....do.....	.....do .....do.
July 3,	Thomas Jones....	Tunnel .....do.....	Explosion of gas in the mines.
July 3,	Redm'n Magrath	.....do.....do.....	.....do..... .....do.
July 3,	Thomas Canfield	.....do.....do.....	.....do.....do.
July 3,	Michael Malin ...	.....do.....do.....	.....do. .....do.
July 3.	Michael Duffy ...	.....do.....do.....	.....do.....do.
July 3.	James Bottomly	.....do.....do.....	.....do.....do.
July 3,	John Boyle.....	.....do.....do.....	.....do .....do.
July 12,	Patrick Johnson	Girard.....do.....	Fall of coal in..... .....do.
July 12,	John Hore	.....do.....do.....	.....do.....do.
July 12.	John O'Donnell..	Glen Carbon.....do.....	Explosion of gas in...do.
July 12,	Barth. O'Donnell	...do.....do .....do.....	.....do.....do.
July 12,	William Brauan,	...do.....do.....do.....	.....do.....do.
July 12.	William Snidden	...do.....do.....do.....	.....do..... .....do.
July 14,	Sam'l Murdock..	Wiggan's .....do.....	Fall of coal in.....do.
July 14,	Liddel Gouldney	.....do..... .....do.....	.....do.....do.
July 14,	Thos. Fitzimons,	Jackson's.....do.....	.....do .....do.-severely.
July 24.	Michael Higgins.	Ravendale.....do.....	.....do..... .....do.
July 30.	Patrick Johnston	Glenwood.....do.....	Explosion of powder..do.
Aug. 6.	William Davis...	St. Clair .....do.....	Run over—lost a leg—in the mines.
Aug. 6,	Michael Keatting	Manhattan.....do.....	Explosion of gas in.....do.
Aug. 22,	Patrick Shevely,	Yatesville .....do.....	Fall of coal in.....do.
Aug. 23.	Thomas Fruat....	Nes., No. 3.....do.....	Collision—jaw broken—in..do.
Aug. 23,	John Coleman....	Kentucky .....do.....	Explosion of powder in.....do.
Aug. 23,	Jas. Engelberger	.....do.....do.....	.....do.....do.
Aug. 24.	Thomas Moore...	Fowler's ... .do.....	.....do.....do.
Aug. 24,	A Scotchman.....	.... do.....do.....	....do.....do.
Aug. 24,	James Morris.....	Star.....do..	Fall of rock—lost a leg—in..do.
Aug. 28,	Thomas Ferris...	Fowler's .....do.....	.....do.....do.....do.
Aug. 30.	Thomas Martin..	East Mt. Caffee.....	Ankle crushed in rollers.
Sept. 2.	Patrick Murphy	Pine Knot....Colliery	Arm broken in the mines.
Sept. 3.	A Welshman	Rauch Creek ...do.....	Explosion of powder in the mines.
Sept. 10.	Michael Maley...	Mine Hill Gap ..do.....	Explosion of a blast in.....do.
Sept. 10,	Christ. Morther..	.....do..... do....do.....	.....do.. .. ..do .....do.
Sept. 14,	William Lee	Wadesville Shaft.....	.....do.....gas in.. .. ...do.
Sept. 18.	David Thomas...	.....do .....do..	.....do.....do .....do.
Sept. 20.	Wesley Hand.....	Rauch Creek Colliery	Fall of a drill in..... .....do.
Sept. 20,	Jacob Weidel.....	...do .....do.. .....do.....	Crushed by a fall of coal.
Sept. 20,	W. Williams.....	Manhattan.....do.....	....do.....do.....severely.
Sept. 20,	John Camford....	Hammitt .....do.....	.....do....between wagons.....do.
Sept. 22,	John Jinkins.....	Revenue.....do.....	Arm crushed in mines—badly.
Sept. 23.	James Norris	Ledger Vein	Fall of rocks—leg amp.—in mines.
Sept. 23,	Jere. Campion ...	Glen Carbon.....do.....	Ankle inj., badly, by wagon...do.
Sept. 24.	John Ryan	Gorman's... .....do.....	Falling off a loaded car.
Sept. 25,	Jos. Workman...	Lorberry .....do.....	Explosion of a blast—lost a leg.
Sept. 26.	Malachi Horey ...	Girard .....do.....	Run over by a loaded wagon.
Sept. 27,	James Mayer.....	Otto, No. 1.....do.....	Thigh broken—badly—fall of coal.
Oct. 2,	John Smith.....	Duncan.....do....	Explosion of gas—badly.
Oct. 2,	Hugh Murry.....	Preston, No. 2..do.....	Leg broken by a loaded wagon.
Oct. 4.	Solom'n Silliman	Hein's..... .....do.....	Boiler exploding at the mines.
Oct. 4,	John Murry.....	...do.....do.....	...do.....do.
Oct. 24,	Frank Waters ...	Greenwood..... do.....	Fall of coal in the mines.
Oct. 24,	Dugal Logan.....	Wadesville Shaft.....	Toes cut off by wagons in the mines.
Nov. 7,	Jonath'n Thomas	M'Neil's .....Colliery	Crushed by wagons in .....do.
Nov. 7,	Henry Price.... ..	Ashland..... .....do.....	Fall of coal.....do.
Nov. 9,	John Shaw.....	Bost. & M. C. Co. do.....	Crushed by wagons in .....do.

List of Maimed Persons, &c.—*Continued.*

Date. 1869.	Persons' names.	Locations where injured.	How injured.
Nov. 9,	Aaron Lane.....	Plank Bridge Colli'ry	Crushed and head cut in the mines.
Nov. 15,	James Flanagan.	Maple Dale .....do.....	Crushed by a loaded wagon.
Nov. 16,	John Kennedy...	Garretson's.....do.....	Rush of coal in a breast.
Nov. 19,	Jas. Duffey, boss.	Mt. Laffee .....do.....	Explosion of gas.
Nov. 19,	Thos. Collins, "	....do.....do.....	.....do.....do.
Nov. 19,	Schovelin, "	.....do.....do.....	.....do.....do.
Nov. 19,	Reese Thomas "	.....do.....do.....	.....do .....do.
Nov. 19,	Thos. Dalton, "	.....do.....do.....	.....do .....do.
Nov. 19,	Evan Cyrus. "	.....do.....do.....	.....do.....do.
Nov. 19,	Mich'l Boran, "	.....do.....do.....	.....do.....do.
Nov. 19,	Pat. Larkin, "	.....do.....do.....	.....do.....do.
Nov. 19,	W. Doogan, "	Coal Ridge.....do.....	Crushed in the mines.
Nov. 22,	James Stack	Yatesville .....do.....	Ankle injured in the mines.
Nov. 27,	Thomas Powell...	Shenandoah .....do.....	Legs broken—fall of coal in mines.
Nov. 29,	David D. Lewis..	Honey Brook...do.....	Foot badly crushed, in.....do.
Dec. 1,	George Goodhead	Shenandoah .....do.....	By a shot in a pillar.
Dec. 1,	Arthur Haywood	Turkey Run....do.....	Log rolling over him.
Dec. 13,	Joseph Mitchell..	Kear. H. M. G. do.....	Explosion of gas in mine.
Dec. 13,	John Lanaghan ..	...do...Mine Hill do.....	.....do.....do.
Dec. 13,	H'y Underwood..	...do.....do.....do....	.....do.....do.
Dec. 13,	W. Williams, Jr.	...do.....do.....do.....	.....do..... .....do.

Eighty-six persons injured—about one-half maimed for life.

Of the above-named persons that were injured, 21 were injured by falls of coal in various manners; 3 by falls of rock, etc., in the mines; 2 by falls in shafts, slopes, etc.; 3 by falls in rollars, screens and beltings; 31 by explosions of gas in the mines; 9 by explosions of powder in the mines; 15 by various sorts of accidents in the mines—total injured, 86; since December 25, 1869, 5—total 91. Many of whom lost limbs, and are maimed for life; and some having families, are thereby incapacitated to maintain themselves or their families, and must become a burthen to the county. Some have families abroad.

A SUMMARY *of the slopes of Schuylkill county, showing their depth in feet, their section area, the number of lifts sunk, the gauge of tracks, and the number of track, for the year ending December* 31, *A. D.* 1869.

P. F. M'ANDREW, *Clerk.*

Operators' names.	Location of Collieries.	Number of slopes.....	Depth in ft.	Slope depth in feet.....	Section area of slopes in feeet.	Number of tracks.....	Inches—gauge of		
							Car tracks. 2.	Pump tracks. 1.	Man road. 1.
J. W. P. Ryon	Glenworth	1	2	602	22 by 20 by 8 168	4	48	48	42
Do	do	1	2	600	20 by 22 by 8 168	4	48	48	42
John P. Broek	Ashland	1	1	768	40 by 36 by 10 380	4	72	60	42
H. L. Cake & Co	Lost Creek	1	1	369	24 by 22 by 8 184	4	72	60	42
Buckly & Moody	Preston, No. 2	1	1	249	20 by 18 by 8 152	4	48	42	42
Do do	do New	1	1	550	20 by 18 by 8 152	4	48	42	42
Bancroft. Lewis & Co	Ashland	1	1	534	19 by 16 by 11 192	2	60	60	
Whitlesy & Co	Ravendale	1	1	900	22 by 19 by 8 164	4	48	48	42
Do	do	1	1	670	22 by 18 by 8 160	4	48	48	42
Gorman & Co	Delano Colliery	1	1	320	20 by 18 by 9 171	4	44	44	40
J. O Rhoades	Shenandoah	1	1	772	20 by 18 by 8 152	4	48	42	40
J. Whitlesy & Co	do	1	1	390	28 by 24 by 7½ 390	4	44	48	44
John Maginis	Taylorville	1	1	285	22 by 20 by 10 210	4	44	44	40
Lucas. Denings & Co	Glen Carbon, West	1	1	270	24 by 22 by 8 184	4	44	48	42
Do do	do	1	1	600	24 by 20 by 12 268	4	48	48	48
J. C. Oliver	Eagle Hill	1	1	320	20 by 18 by 8 152	4	44	48	
Do (inside)	do	1	1	400	20 by 16 by 8 144	4	48	44	42
Dutter & Co	Windy Harbor	1	1	270	23 by 18 by 10 205	4	40	42	40
Do	do	1	1	540	23 by 18 by 10 205	4	48	42	42
Morgan Williams	Phœnix, No. 1	1	1	600	22 by 20 by 10 210	4	48	44	36
Do	do (inside)	1	2	975	20 by 18 by 8 152	4	48	48	40
Johnson & Dovy	do No. 2	1	1	607	24 by 20 by 10 220	4	48	48	44
Zack Boyer	do No. 3	1	1	570	25 by 20 by 7 157	4	40	60	40
Cain, Hacker & Cook	Otto, No. 1	1	1	750	22 by 20 by 8 168	4	44	48	44
Do do	do No. 2	1	1	720	30 by 27 by 9 256	4	44	48	44
Do do	do No. 3	1	1	720	24 by 20 by 8 176	4	44	48	44
Claud While	Swatara, No. 1	1	1	570	24 by 20 by 8 176	4	44	44	42
Do	do No. 2	1	1	150	18 by 14 by 6 96	3	48	44	
Do	do No. 3	1	1	195	28 by 18 by 6 114	4	48	44	34
Koll & Zerenoltz	Newtown	1	1	300	18 by 16 by 7 119	2	72	48	
Jacob Lawrence	P. and Reading R. R. planes	1	1	300	24 by 20 by 8 176	4	44	44	42

Whitstone & Wood	Tamaqua	1	1	309	24 by 21 by 7	157	4	44	44	.....
John B. M'Creary	Honey Brook	1	1	240	22 by 20 by 8	168	4	42	48	42
Do do	do No. 2	1	1	510	22 by 20 by 8	168	4	42	48	42
Do do	do No. 3	1	1	600	22 by 20 by 8	168	4	42	48	42
John Wadlinger	Hecksecherville	1	2	780	24 by 20 by 8	176	4	44	48	44
Do do	do (old)	1	1	310	24 by 20 by 8	176	4	44	48	44
T. H. Schollenberger	Mount Pleasant	1	2	780	22 by 20 by 9	189	4	44	48	42
Eugene Borda	Greenwood	1	3	840	26 by 24 by 10	250	4	48	44	42
Do	Bull Run	1	1	285	30 by 28 by 12	348	4	48	48	42
Denison & Brothers	St. Nicholas	1	1	366	24 by 22 by 8	184	4	60	40	36
Hill & Harris	Mahanoy City	1	1	366	26 by 22 by 10	240	4	48	48	42
Tremont Coal Company	Middle Creek	1	1	321	24 by 22 by 8	184	4	44	48	42
Do do	do No. 2	1	2	430	24 by 22 by 8	184	4	44	48	40
Do do	do No. 3	1	2	465	26 by 23 by 8	196	4	44	48	44
Do do	Donaldson	1	2	492	24 by 22 by 8	184	3	48	48	.....
Do do	do No. 2	1	1	591	26 by 24 by 7½	187	4	48	48	44
Do do	do No. 3	1	4	780	24 by 22 by 8	184	4	44	48	42
Lewis & Neitting	do S. C. Co.	1	1	321	24 by 22 by 8	184	3	44	48	.....
Savage & Kauffman	Williams Valley	1	1	450	22 by 18 by 8	160	4	48	44	42
Savage & Althouse	do Tower City	1	1	255	22 by 18 by 12	246	4	48	44	36
Henry Heil	Rauch Creek	1	1	690	16 by 13½ by 8	156	3	48	44	.....
Do	do No. 2	1	1	363	26 by 18⅓ by 8	178	4	44	48	44
Miller & Graff	do lower	1	2	801	24 by 21 by 8	180	4	44	48	42
Do	do East	1	1	420	24 by 20 by 8	176	4	44	48	72
J. H. Osterman	Broad Mountain Vein	1	1	420	24 by 22 by 8	184	3	44	48	.....
G. H. Potts	Wolf Creek	1	4	1,443	24 by 20 by 8	176	4	44	48	44
Do (old)	do pumping	1	2	900	24 by 20 by 7	154	3	44	44	.....
William & Thomas Kear	do	1	5	1,520	22 by 20 by 7	147	3	48	44	.....
Barker & Co., (idle)	Mine Hill Gap	1	2	550	20 by 18 by 8	152	4	44	44	30
Joseph Patterson, Philadelphia	West Mount Laffey	1	2	960	24 by 21 by 8	180	4	48	44	40
L. S. Baldwin, Agent	East Pine Knot	1	2	705	24 by 20 by 8	176	4	48	44	42
Do do	West Pine Knot	1	2	711	24 by 20 by 8	176	4	48	48	48
Thomas & William Kear	Mine Hill Gap	1	3	900	24 by 20 by 8	176	4	48	44	42
E. C. Whitley & Co	Silver Creek	1	1	300	20 by 16 by 6	108	3	42	44	.....
Murry & Winlack	do East	1	1	229	21 by 19 by 10	200	3	42	48	.....
Do do	do inside	1	1	330	21 by 19 by 10	200	4	42	48	42
J. K. Seigfreid	Mount Laffey	1	2	780	22 by 18 by 8	160	3	44	48	.....
G. W. Pomroy & Co	Mount Revenue	1	2	600	20 by 18 by 8	182	4	42	44	40
Russell, Evans & Co	Mount Dexter	1	1	300	16 by 14 by 7	105	3	42	48	.....
Duncan Coal Company	Duncanville	1	5	1,510	24 by 18 by 6	132	4	44	48	42
Christ Frans	Wadesville	1	1	600	14 by 12 by 6	78	2	42	42	.....
Do	do North	1	1	300	16 by 14 by 6	90	3	42	42	40
Charles Saylor	do West	1	1	270	20 by 16 by 6	108	3	42	42	40

STATEMENT—CONTINUED.

Operators' names.	Location of Collieries.	Number of slopes.....	Depth in ft.	Slope depth in feet.....	Section area of slopes in feet.	Number of tracks.....	Inches—gauge of		
							Car tracks. 2.	Pump tracks. 1.	Man road. 1.
Boston and Mahanoy Coal Company ...	Gilberton.....	1	1	330	26 by 24 by 8 200	4	44	44	44
Do.....do.....(old pumping)	.....do.....	1	1	330	18 by 16 by 8 146	3	44	44	44
G. S. Repplier.....	New Castle, old.....	1	1	150	20 by 16 by 8 144	3	44	48	....
Do.....East.....	.....do.....do.....	1	1	650	24 by 22 by 7 161	4	44	48	42
Do .....West.....	.....do.....new	1	1	720	24 by 22 by 7 161	3	44	48	.....
Lucas, Dening & Co.....	.....do .....North	1	1	225	21 by 6 126	2	72	48	....
G. Wm. Johns	St. Clair.....	1	1	300	20 by 18 by 7 133	3	44	44	.....
Do	..... do.....inside	1	1	600	20 by 18 by 7 133	4	44	44	42
Buck & Althouse	Gilberton.....	1	1	390	20 by 18 by 8 152	4	44	48	30
William Draper, Philadelphia	Upper Gilberton	1	1	380	12 by 10 by 8 88	3	48	40	30
P. D. Luther & Co.....	Kaskawilliam.....	1	1	237	15 by 13 by 7 98	3	44	48	.....
Do.....	.....do.....North.....	1	1	300	20 by 18 by 7 133	3	44	44	40
Do.....	.....do .....South vein.....	1	1	310	20 by 18 by 7 133	3	44	44	....
Schall & Donahue.....	Tuscarora.....	1	1	525	24 by 22 by 7 161	4	44	44	44
Segerez & Co.....	Tuscarora Swift Creek.....	1	1	480	24 by 22 by 8 184	4	44	44	40
Rowbotham & Co., (sinking)	.....do .....do.....	1	1	330	16 by 14 by 6 90	2	44	44	....
Barry, M'Neill & Co.....	Wastehouse Run	1	1	285	22 by 20 by 7 147	3	44	48	.....
M'Neill & Co.....	.....do .....West	1	1	300	16 by 12 by 12 168	2	44	48	.....
Do	.....do.....North.....	1	1	90	16 by 14 by 8 120	2	44	40	....
John P. Brock	Locustdale.....	1	1	462	24 by 22 by 8 184	3	48	44	44
Henry Eshelman.....	N. Mahanoy	1	1	285	24 by 20 by 8 176	4	44	48	40
David Kelly, (Jersey)	E. Mahanoy.....	1	1	310	24 by 16 by 7 126	4	44	44	40
Henry Eshelman	.....do.....	1	1	275	20 by 18 by 8 133	2	60	42	.....
E. Bast & Co.....	Big Mine Run.....	1	2	822	24 by 20 by 8 176	4	48	44	44
Wood & Co...	Sharp Mountain	1	1	420	12 by 10 by 6 66	2	32	30	.....
Henry Guitterman.....	Coal Hill.....	1	2	640	20 by 16 by 8 144	3	44	44	.....

100 slopes—11 more not yet visited—total, 111 slopes; will equal 10¼ miles long.

TOTAL NUMBER *of Shafts in the county that have been visited during year ending December* 31, *A. D.* 1869.

Operators' names.	Location.	No. of	Depth in feet.	Cage tracks.	Pump track.	Section and squares.	Section areas.
Grant, Lee & Co	Shenandoah	1	324	2	1	16 by 8 feet.	128 square feet.
John C. Northall	St. Clair	1	620	2	1	24 by 10 "	240 " "
Wm. Draper	Wadesville	1	666	2	1	24 by 10 "	240 " "
Lucas & Denings	Glen Carbon	1	300	2	1	18 by 10 "	180 " "
Do	do	1	270	2	1	16 by 9 "	144 " "
James Oliver	Eagle Hill	1	309	1		12 by 8 "	96 " "
G. W. Snyder	St. Clair	1	300	2	1	20 by 10 "	200 " "
J. M. Beatty	Girardsville	1	124	2	1	16 by 8 "	128 " "
Hosea & Longstreet	Silver Brook	1	104	2	1	16 by 8 "	128 " "
Eugene Borda	Tamaqua	1	364	2	1	20 by 13 "	260 " "
J. Wadlinger	Thomaston	1	300	2	1	16 by 10 "	160 " "
Do	do old	1	300	2	1	16 by 10 "	160 " "
M'Neill & Co	Waste House Run	1	85	2	1	20 by 10 "	200 " "
Richard Heckscher	Shenandoah	1	287	2	1	26 by 12 "	312 " "
S. E. Griscom	Near Shenandoah	1	250	2	1	28 by 12 "	336 " "
Kendrick, Devey & Co	East do	1	144	2	1	18 by 8 "	144 " "
Heins & Glasmire	New Philadelphia	1	300	1	1	18 by 6 "	104 " "

Seventeen shafts, equal 5,047 feet—one mile nearly.

A SUMMARY *of the number of drifts now working in the county, by whom and where at—year ending December* 31, *A. D.* 1869.

Operators' names.	Location.			Length in feet.
H. L. Cake & Co	Seitzinger's Patch	2	4	15,000
J. J. Conner	Girardsville	5	5	15,500
Eugene Borda	Tamaqua	2	4	14,750
Wm. F. Patterson	Mahonoy City	2	4	5,170
E. S. Silliman	do do	5	5	11,450
Bedford, Cox & Co	do do	2	3	3,150
Atkins & Bros	Gelberton, north	2	4	800
William L. Williams	Shenandoah City	2	3	3,006
John Beach	Maple Dale	4	8	13,274
H. A. Moody	Girardsville	1	1	7,689
Eugene Borda	Tamaqua	2	4	3,750
John Johnson	Dr. Borda's	2	3	3,550
Hill & Harris	Mahonoy City	3	7	4,151
Nevils & Bros	do do	1	3	10,200
Tremont Coal Company	Donaldson	2	4	8,595
Buckly & Moody	Girardville	3	4	10,280
J. R. Cleaver	Ashland	2	3	9,300
James Bowen & Co	do	1	1	2,460
E. J. Philips	Waste House Run	3	6	12,480
John Whitstone	Tamaqua	2	4	1,950
Fowler & Co	Waste House Run	2	4	7,428
M'Neill & Co	do do	2	4	11,400
Jacksons & Co	do do	3	6	3,300
Kear & Patterson	Mahonoy City	2	2	3,500
J. Donaldson & Bro	Raven Run	3	5	9,300
Heaton & Bros	do	2	3	9,400
S. E. Griscom	William Penn Colliery	3	5	7,650
Horan & Conner	Ashland	2	2	9,300
J. P. Brock	Keystone	2	2	12,175
Emanuel Bast	Big Mine Run	3	3	11,100
Rickert & Co	Mount Laffey	1	2	2,400
Duncan Coal Company	North Pottsville	1	1	800
Boyler & Co	Mahonoy City	2	4	4,860
East Mahonoy Coal Company	do do	3	5	6,750
Copely Colliery	East Mahoney City	3	5	6,000
Claud White	Swatara	1	2	1,100
J. P. Brock	West Ashland	1	2	9,500
Add 12 land sale drifts, average		12	12	12,000
		96	.....	*284,468

* Nearly fifty-four miles.

INSPECTOR'S STATEMENT *of expenses incurred as inspector of the mines of the county of Schuylkill, for the nine months ending December* 31, *A. D.* 1869.

P. F. M'ANDREW, *Clerk.*

Nine months' rent, @ $300 per annum	$225 00
Nine months' office rent, @ $80 per annum	60 00
Nine months' stable rent, @ $50 per annum	37 50
Nine months' water rent, @ $6 per annum	4 50
Nine months' post office rent, @ $2 per annum	1 50
Nine months' gas rent, @ $60 per annum	45 00

Revenue tax on salary	$100 00
School and borough tax, one year	15 00
Two horses cost	500 00
Two sets harness, etc	100 00
Horse feed, all sorts, one year	450 00
Stable litter	7 50
Horse shoeing and removing	37 50
Horse medicines	6 50
Turnpike tolls, 39 trips, @ 80 cents	31 20
Hostelry, etc	6 50
Telegraph expenses	9 70
137 letters, postage on same @ 3 cents	4 11
1,000 envelopes, 680 on hand	6 50
One ream letter paper	7 50
One copying press and fixtures	13 00
Two sets window blinds	5 20
Brief paper for State report	6 00
Letter copying book, etc	2 50
Seventy-three letter stamps, @ 3 cents	2 19
Five tons coal, hauled, etc	25 00
Carriage and its repairs	150 00
Carriage, extra repairs	24 40
Office desk and top	40 00
Four chairs, @ $4 each	16 00
One drafting table, etc	4 00
Stove and fixtures	10 00
Three Davy lamps, @ $6	18 00
Four common lamps, @ 50 cents	2 00
Two tape lines, 100 and 60 feet	4 25
Four thermometers, @ 75 cents	3 00
186 days on duty, @ $2 25 per day	418 50
Two suits mining clothes	40 00
Pens, pencils and inks	3 50
Incidental expenses (not less)	29 00
Four large and five small office books	8 20
	2,471 25
Property on hand	844 47
Amount actual cost	1,626 78
Deputy and clerk's expenses	618 47
Amount	2,245 25

JOHN ELTRINGHAM,
Inspector of Mines for Schuylkill county.

Attest—P. F. M'ANDREW,
Assistant and Clerk.

A LIST *of maps of Collieries furnished, portraying the internal workings of each mine, the length and number of breasts and gangways, inlet and outlet air-courses, of ingress and egress safety road, &c., on file in this office.*

1869.	No.	Operators' names.	Location.	Names of Collieries.
Dec. 13,	1	J. O. Rhodes	Shanandoah City	Shenandoah Slope.
" 14,	2	Mr. Phillips.	Suffolk	Suffolk Drifts.
" 21,	3	E. S. Silliman.	Mahanoy City	Silliman Drifts and Slope.
" 21,	4	G. W. Cole	do do	Tunnel Ridge...do ....do.
" 21,	5	Hill & Harris	do do	Hill & Harris...do....do.
" 21,	6	Wiggan & Treibles	St. Nicholas.	Wiggan & Co...do....do.
" 21,	7	William Reicht	Norwegian	Duncan. ....do....do.
" 21,	8	Buckley & Moody	Girardville, No. 1	Preston, No. 1..do.... do.
" 21,	9	do do	do No. 2	do....No. 2..do....do.
" 21,	10	do do	do No. 3	do....No. 3..do ....do.
" 21.	11	do do	do No. 4	do....No. 4..do....Shaft.
" 22,	12	Frank Denison & Bro.,	St. Nicholas.	Boston & Mahanoy Coal Co.
" 22,	13	Major Baldwin, agent,	Greenberry Valley,	East Pine Knot Slope.
" 22,	14	do do	do do	West Pine Knot...do.
" 23,	15	Henry Williams, Agt.	Gilberton, North	Gilberton ....do.
Jan. 3,	16	Shall & Donohoe	Tuscarora.	Kentucky Bank...do.
" 12,	17	M. P. Fowler, Pres't	Wastehouse Run	Glenville Drifts.
" 12.	18	Altar & Focht.	Mahanoy City.	Delano Tract Drifts.

I have now on file in my office, 18 maps of collieries which I deemed necessary to be furnished with, and have called for some 80 more maps, and I find some difficulty to obtain them from some parties, who seem to differ with the present construction of the law relating to maps, &c., as not being explicit, sufficiently so as to decide which parties are compelled to furnish the maps and bear the costs.

No. 1.—Saint Clair Shaft.

Inspected April 14, 1869.

Description.—I herewith submit a detailed statement of the above colliery, as herein set forth. The colliery is located at St. Clair, four miles north of Pottsville, on the line of the Mill Creek railroad, on the estate of Henry C. Carey, Esq. Leased and operated by John C. Northall, Biddle & Co. It consists of a shaft sunk on the Mammoth vein, 620 feet deep, its section area being $24 \times 16 = 384$ square feet. having two cage and a pump road. Which pump road is securely partitioned off from the cage roads. The superstructure is carried up 80 feet above the shaft, that the cages may empty the coal into the breaker schute. The whole height being 700 feet. A 2 inch wire rope is used, its straining weight being 65 tons, while the attached weight is 6 tons. The shaft and machinery is well protected for safety of persons, and under the management of competent persons. I inspected the various districts of the mine, and find it very extensive. Three lifts are operated in the mine by self acting planes, which bring the coal to the shaft, which is the lowest point of the mines. The coal is instantly delivered at the surface. The arrangement at the planes is safe and secure. A great number of gangways traverse the mines. Some 225 persons are daily at work in these mines. It is one of the most extensive mines in the county. I have explored the districts where gas is evolved, and have found

considerable bodies of it in the form of carburetted hydrogen gas, with some black or choak damp. Estimated percentage of inflammable gas from 12 to 20 per cent. In some localities, by measurement, I found the air current to be nearly satisfactory. A steam fan ventilator is used at the bottom of the shaft, which throws the exhaust steam up the upcast shaft, and works admirably well. Steam is received from the surface boilers by a pipe led down the shaft and well secured in position to the fan cylinder, as the fan draws the air from the mine it delivers it up the upcast air shaft. The speed of the air current was 4⅛ feet per second. Fearing accidents arising from explosions of gas, I would prefer to locate the fan at the surface. For such an extensive mine as this I would recommend a hose attached to an engine that would play on any district on fire. A 500 horse power steam pump is placed in the mine, two 20 inch columns, a cylinder, 5 feet diameter and 14 feet stroke, the rods of which are 14 in.+16 in. Most of the miners use the Davy lamps. I have instructed the miners in the duties belonging to them for their safety, and directed the boss miner and his firemen to have all lamps brought out of the mine every night, and placed in the hands of a proper person, whose duty it should be to brush and clean them, and have each numbered and marked on his book with the persons name using them, they to be inspected every morning as the miners receive them, and again in the mine by a fireman, to see they are safely locked and handled. That no miner or other person shall pass into any district or working place in the mine until first he receives directions from the person having charge of that district, and besides, to learn if his working place is safe and free from any gas. All of which instructions are promised to be faithfully respected, and now for the third time visited, no complaints. Killed, Oct. 18, Samuel Westwood. Sept. 6, Wm. Davis lost a leg.

Ventilation.—The shaft is used as a downcast air shaft, the air splits at the bottom of the shaft and goes east and west in the main gangways for a distance, to where check doors are placed to force the air up into the working districts, through the cross holes in the pillars and through the working breasts, to the fan; thence returns back by the air courses to the out-cast shaft at the fan. The velocity of the fan is always regulated by the complement of air needed. Every precaution to secure the safety of the miners is attended to.

Gangways.—There are some 23 different gangways in the mine, amounting in the aggregate length to 9 miles. Some 32 breasts, working each 30 feet wide, and average 218 feet long, and pillars of 24 feet thick. Section area, 66½ square feet.

Engines.—Five hundred horse power steam pump, double-acting, 60 in.+14 feet cylinder; two 20 in. columns; a 19 feet fly-wheel; 8 arms, rim 6 in. ×10 in.=60 square inch section; 12+16 feet shaft. Fifty horse hoisting engine used at the shaft; a 16 in.+4 feet cylinder; 2 drums, 10½ feet diameter and 10 feet long, with horns to protect the rope; drum planking, 8 in. timber; 1,480 feet 2 inch wire rope in use, breaking strain 65 tons, loaded weight 6 tons; rope sheaves, 12 feet diameter, with 8 inch grooves, and 1,350 feet of 1¾ inch wire ropes, used in the mines on the incline planes; strain 54 tons, loaded weight 4 tons.

Recapitulation.—One shaft, 620 feet perpendicular depth, and 80 feet to the platform=700 feet deep; section area, 24×16=380 square feet. Killed, 1; injured, 3. Visits, 3; miles traveled to and in the mines, 30 miles; 23 gangways, length of ditto, 47,520 feet; outside tracks, 1,860 feet; total length of tracks laid, 9¾×miles of 25 lb. rail=386$\frac{640}{2240}$ tons; 32 breasts, 30 feet wide and 218 feet long, 24 feet thick; 4 engines=590 horse power; 13 boilers, 34 in.×30 ft. long=390 feet long, 11 of which are good and 2

patched, one of which condemned; surface of grate, 175 square feet; 2 pumps, 500 horse power; breaker engine, 50 horse; 4 boilers, 30+26 ft.= 104 feet long; one 10 horse steam fan in the mines, 12 ft. diameter; 3 escape roads for miners, areas of which 4×5=20 square feet; force employed inside and out, 325 men and boys; 23 mules and 70 wagons; temperature outside, 72°; temperature inside, 54° to 61°; speed of air current, ¾ times slow; ventilation good; 3 visits; number of miles traveled, 30 miles; shipping capacity at present, 70 railroad cars per day; full capacity, 160 cars per day. The condition of the mines and machinery is very favorable. Officers names: George Hudson, boss miner; first enginemen, James Garland, James Hopkins; first machinist, Albert Perry. All of which are competent men. Per cent. of gas, 12; per cent. of choak damp, 6; acid in water, 5 per cent.

No. 2.—Wadesville Shaft Colliery.

Inspected April 19 *and* 20, 1869.

Description.—I submit herewith a detailed statement of the above named colliery, as herein set forth. This colliery consists of a new shaft sunk 666 feet deep, through several coal veins, till it reached the Mammoth vein, which underlie the Red Ash veins of the district. Section area, 24×14= 336 square feet. The shaft is located on the estate of Wetherel and Seitzinger, located at Wadesville, 3¼ miles north of Pottsville, on the line of the East Mt. Carbon railroad, one mile west of St. Clair. The colliery is operated by Wm. Draper, Esq. The shaft was sunk under the superintendence of John C. Northall, and is one of the best and most substantial jobs of the kind in the State for strength and safety. It consists of 2 cage ways and a pump way, which are securely partitioned off; these cages are covered and protected by a movable frame that protects the entrance of the shaft whilst the cages are in the mine. Persons decending or ascending are protected by the cage cover, and every possible attention given for their safety. The engineman is notified by the bell signals at his engine, by a wire drawn at the bottom of the shaft, when the cages are to be drawn up, and when men are in the cage the engineman works his engine slow and with great care. Two large traveling safety roads coming out to the surface, one of which is 1,600 yards from the shaft, the other 2,280 yards, and a safe manway drove through strong pillars, to protect miners and keep them from traveling on the inside incline planes; one of which is 752 feet long, at an angle of 14°, the other 520 feet long, at an angle of 8°, each having two tracks and self-acting machinery of great strength The colliery is ventilated by one of Beadle's steam fans, of 20 horse power, 18 feet diameter, and located on the surface, 1,600 yards north of the shaft, on the traveling road, which constitutes both the out-cast air shaft and safety road; this fan has great power on the air draft. Every reform proposed for the better ventilation and protection of the lives of the miners is taking place as rapid as possible. I have traversed the different districts of the mine, and ascertained that a large amount of carburetted hydrogen is evolved, and also a considerable body of water dammed up in an old level gangway; that the eastern district of the lower and middle levels are a little crushed, in consequence of the weakness of the pillars; that traveling on the planes is dangerous to life, and using common lamps in districts where gas is evolved must be positively prohibited. I here called on a committee of

miners, together with the manager and firemen, to accompany us, and requested them true answers make to any questions asked, and further make known the condition of the mine, and they, in their capacities, bear testimony to the many reforms I have recommended for the safety of the miners, and the manner of conducting air and air courses, safety traveling road, and securing the works. We have visited this mine for the third time, and found the improvements taking place. June 15, Ellis Johnson was killed by slipping in the pump shaft and falling 102 feet. Sept. 14 and 18, Wm. Lee and David Thomas got burned by gas, slightly. Oct. 27, Dugal Logan, toes cut off. The coroner's inquisition rendered a verdict of accidental death.

Ventilation.—The shaft is used for a downcast intake, the air pass in the main gangway to a check incline plane, up the first plane to the first level; here the air is split by a check door, and some passes in east and north and west into the working districts; thence it returns through cross-headings through the breasts, into the main north air course, and out to the fan; the different gangways have check doors to command and collect the air, and force it into the working chambers; the miners using safety lamps only, except where no danger is apprehended from gas. There is very strict regulations established in this colliery.

Gangways.—It is estimated that there is $6\frac{1}{2}$ miles of gangways in the three lifts of this mine; the coal is 14 feet thick in the Mammoth vein; the area of air courses is 30 square feet, and the area of the fan out-cast air shaft is 96 square feet. No danger can possibly occur to the miners should an accident occur to the shaft, as the traveling roads are quite safe and sufficient.

Engines.—Two 90 horse engines used in the slope, $17\frac{1}{2}$ inches+$4\frac{1}{2}$ feet cylinder, link motion; two drums 18 feet diameter, each $13\frac{1}{2}$ feet long, planked by 12 inch timber; a toothed wheel 21 feet in diameter is placed on the drum shaft and in the centre, which is moved by a pinion wheel which is moved by the rods of the cylinders; the shafts are 14 inches+14 feet long, of wrought iron, all of great strength; 1,700 feet of $1\frac{3}{4}$ inch wire ropes used in the shaft; 1,650 feet $1\frac{1}{4}$ inch ropes used on No. 1 plane, and 1,350 feet 1 inch rope used on No. 2 plane; in all 4,500 feet; two breakers erected for the use of the shaft, each run by a 40 horse engine, the machinery of which is new and in the best condition. 20 horse fan engine, a 20 horse saw mill engine, in all five engines; a 500 horse power pump in the shaft, with two 20 inch columns; 6 engines=800 horse power; 19 boilers, 34 inch+from 20 to 30 feet long=484 feet; surface of grate, 250 square feet.

Remarks.—We have visited this colliery three times, fearing any neglect, and am pleased to say that the progress is encouraging; the safety roads are getting in good condition; the signals are attended to, and no complaint, and, as far as possible, the air courses and check doors are receiving due attention, and everything done for the safety of the miners as fast and satisfactorily as can be expected, no complaints coming in about neglects, etc.

Recapitulation.—One shaft, 666 feet deep; two cage tracks; one pump track; two cages, covered with sheet iron; 1,700 feet of $1\frac{3}{4}$ inch wire rope used; two inside incline planes, 3,000 feet wire rope used; 20 gangways, 34,320 feet long; 23 breasts, working each 30 feet wide, 180 feet long, and 14 to 20 feet thick; 24 feet thick pillars; one boy killed; one man injured; three veins, the coal 30 feet thick; one 20 horse steam fan; a 20 horse power saw-mill; 500 horse pumping engine; two 40 horse breaker engines; two 90 horse shaft engines; two good safety-escape traveling roads; 19 good boilers=484 feet long; $6\frac{1}{2}$ miles inside tracks, one-half mile outside track=36,960 feet T rail laid, of 25 pound rail=$277\frac{1}{4}$ tons; 350 men and

boys employed; a steam indicator used, and 70 pounds of steam carried; outside temperature, 83°, Oct. 8; do. in shaft, 58°; in the air-course, 66°; head of No. 1 plane, 68°; in the traveling road, 62°; motion of air, found by measurement, was 4½ times slow; per cent. of gas evolved, 12; do. of acid in water, 8; condition of mines might be better; shipping capacity, 80 to 100 cars per day; can ship, when in full operation, 200 cars per day; 21 mules and 60 wagons in use; grate surface, 252 feet; miles traveled, 27.

The sinking of this great shaft was committed to the care and experience of Mr. John C. Northall. The cost of establishing the colliery did not fall much short of $500,000. Through his persevering industry, the problem of penetrating the Mammoth vein was solved; and by his conduct, he gained the respect and friendship of his employers, who, at the final completion of the shaft, presented him with a memento of their esteem.

No. 3—Glenworth Slopes.

Aprtl 21, 1869.

Description.—I have inspected this colliery five times. I herewith submit a detailed statement of the above mines, as herein set forth. This colliery consists of two slopes, sunk on the south dip of Primrose vein on the estate of Messrs. Lewis and Baber; leased and operated by J. P. & W. Ryan. The slope is five miles east of Pottsville, and two and a half miles north-east of Port Carbon; is sunk 602 feet deep, on a 30° south dip, having four tracks; its sectional area being 23+20+7=150 square feet; the slope is well timbered; the sump is fifteen feet deep; the water is discharged by a double-acting 60 horse steam pump; 243 feet in on the east gangway; a tunnel is driven 158 feet north, to the Holmes vein; thence to the Primrose vein. The west gangways on the Primrose vein are 700 yards in. I have examined the four gangways, and found considerable gas in them; and finding the steam fan had but little effect on the air, in consequence of leakages in the schutes and other places in the mine, I measured the current of air, and found it unsatisfactory. The gangway pillars were removed in some places, where the gangway, in consequence, was yielding to pressure. I forbid the use of common lamps in the east gangway on any pretence, owing to the presence of inflammable gas; and forbid John Evans, boss miner, to suffer any powder to be used by any miners, unless he be then present to superintend the firing of shots, etc., as the place was not safe, and would, by careless handling, result in loss of life. The new slope is 200 yards south of the old slope, of the same depth and sectional area, but at that time was only pumping. August 11, Patrick Murphy, a miner, 56 years of age, got burned by gas, and received internal injuries from which he died; and Patrick Johnson received injuries, whilst engaged in mining in No. 9 breast. As Murphy hurriedly entered it, the gas exploded, and hence the result.

Gangways.—The whole length of the gangways in this mine will about average 15,850 feet; their section area is 60 square feet; number of working breasts is 20; breadth of breast, 21 feet; thickness of pillars, 12 to 15 feet.

Ventilation is effected by a steam fan of 10 horse power, 10 feet diameter; the leakage is so much, that one-half its effective power was wasted. I cannot say much for the ventilation in part of the mine; had proper attention been given it, the ventilation would be fair. I have recommended suitable remedies to put the place in a good condition, and promises made it should be attended to; no further complaints of it.

Engines.—A 50 horse engine is used in the old slope, to pump and hoist with; a 40 horse engine used in the new slope to also pump and hoist with; a 25 horse engine in use at the breaker, and a 10 horse fan engine. The six boilers at the old slope supply steam for that engine; also the fan and breaker engines. 3 boilers at the new slope, 32 inches+30 feet; the six boilers are 34+30 feet, in all 9 boilers 30 feet long=270 feet; grate surface 112 square feet; 2 wire ropes, 1,420 feet long each, of $1\frac{3}{8}$ inches=2,840 feet.

Remarks.—Had these mines been managed differently in the out-set, much more coal could be produced and the mines still kept in good condition; it had passed through the hands of persons who seem to lack that judgment necessary to secure a mine as it should be, by not removing the gangway pillars, and leaving the breast pillars very strong to the end of the gangway, and then when mining back, these pillars would yield a large amount of coal at very little cost, and still support the top until finished, thereby retaining the gangway pillars to support it for air or water-courses. The coal could again be taken out of this place from the lower levels by counter schutes, and all saved. The enginemen had not kept the machinery in as good trim as might be, but a better disposition appears to prevail at present in the order of things, and it is hoped to continue amongst the miners. There appears to be very little complaints for want of air, and the steam fan once properly secured, it will relieve this deficiency.

Recapitulation.—The colliery consists of two slopes, each 602 feet deep, section area 23+20×7=150 square feet; south dip, 30°; 6 gangways=14,850 feet long; 1,500 feet outside tracks, 44 inch gauge; 25 lb rail, $3\frac{1}{10}$ miles=120 tons; one 10 horse steam fan ventilator; 3 escape safety roads; 4 stationery engines=125 horse power; 9 boilers, 34 inches×30 feet long =270 feet, and of grate, 117 square feet; 2,700 feet $1\frac{2}{3}$ inch wire ropes; 4 tracks in each slope; 3 pole pumps. Killed July 30, Patrick Murphy; injured July 30, P. Johnson. 5 visits; 5 in mines $7\frac{1}{2}$=32 miles; 20 working breasts 30×180 feet long and 8 feet thick; 3 veins 24 feet thick of coal; 200 men and boys employed; 12 mules; 60 wagons in use; outside temperature 60°, inside 62°; speed of air, $3\frac{1}{2}$ times slow; in west gangway the gas was 12 per cent.; water 10 per cent. acid; shipping capacity 40 cars per day; when both slopes are in operation, can ship 80 cars per day. Officers—John Evans, boss miner; 1st enginemen, M. Regan and James Saricks; E. Delcamp, outside manager. Condition of mines, &c., improving. The colliery is in operation for 30 years, and has been one of the best in that region; there is still a large amount of underlying coal on the tract which will be thoroughly developed in time; the advantages arising from low tolls on coal shipped from these mines is favorable to the operators, and the coal always commands a ready sale.

No. 4.—Tunnel Slope.

Inspected April 24, 1869.

Description.—I submit herewith a detailed statement of this colliery, as herein set forth. This colliery has been visited eight times, it being one of the most dangerous mines in the county, owing to so much carburetted hydrogen being evolved. The colliery is located thirteen miles north of Pottsville, on the south of the town of Ashland, on the estate of John P. Brock & Bro. It consists of a deep slope, sunk on the north dip of the

Mammoth vein, 768 feet deep; on the third left section area 36+40+10= 375 square feet for 468 feet deep; two six feet cage tracks; a six feet pump track, and a good traveling road all throughout. Another safety road is now under way, on the east side, which will commence at the gangway, and run on an angle of 23° out to the surface, independent of any former traveling roads, which can be used for miners and mules. This is a commendable improvement. The slope dips at an angle of 66°, and the coal is from 30 to 60 feet thick. The eastern run of the track is over a mile. A good air shaft is open, east and west of the slope, and runs out to the surface, and communicates with the outcast air shaft at the upper fan. Two steam fans, of the Beadle pattern, ventilate the mines. The mines are now leased and operated by Wm. Patterson, Bro. & Co., who are now perfecting every necessary improvement to secure the mines from accident by fire or otherwise.

The use of any lamps, other than the Davy safety lamps, except in rare cases, is expressly prohibited, and stringent rules and regulations established for the safety of the men. All blasting with powder, except in presence of the boss miner, is forbidden, and none but competent and careful miners employed. July 7, an accidental explosion of gas occurred, which burned seven persons, mostly boys, who, through their own neglect, incautiously communicated the flame.

Ventilation.—The mines are ventilated by two steam fans, one at the bottom and one at the surface of the slope, each 10 horse power. The slope is used as an intake air-course. The air is split at the bottom of the slope, and passes in east and west, through large air courses, carried in along the gangways to the face. The gangways are divided off in sections of 200 feet by check door, which acts as valves in the gangways, to control the air whilst the coal trains pass in and out. The air is forced into the working departments of the mine, and a sufficient quantity made to traverse the idle districts to dilute any gas that may evolve. The fans are kept constantly in motion, night and day. The schute-batteries are very secure and safe, and by a careful and cautious vigilance the mines are safe.

Gangways.—The eastern gangway is in 1,500 feet, and 13 breasts on it, each 30 feet wide, 300 feet long, and 24 feet thick; the west gangway is in 750 feet, and four breasts on it of the same size as the east. The pillars are all 30 feet thick, and cross-holed up in every 20 yards. All the other level gangways are nearly worked out, and the works now are all new.

Engines.—A 90 horse slope engine, 18¼ inches+6 feet cylindar, rods 3¾ inches diameter; all its machinery and shaftings very strong; two 10 feet by 10 drums, planked with nine inch timber; 1,806 feet of 1¾ inch wire ropes used in the slope; the dirt plane rope is 1,000 feet long, 1⅛ inch thick; the plane is 550 feet long; the steam fans, each 10 horse power, are 12 feet diameter; 30 horse breaker engine, 12 inches+3 ½ths feet cylindar; 30 horse dirt-plane engine; steam pump in the slope is 300 horse power; in all, five engines=470 horse power; 14 boilers, 34 inches diameter=356 feet; area of grate surface, 192 square feet.

Remarks.—The new firm is adding three more boilers to the present number, and otherwise improving the condition of the mines as to safety and convenience of the miners; have changed the fan outcast, and are making a new traveling road out to the surface, for the use of men and mules, and otherwise improving the condition of the mines.

Recapitulation.—One slope 768 ft. deep north dip 66°; 2 tracks; 2 wire ropes, 2,806 feet long; 2 gangways, 2,250 feet; 17 breast, 30 feet+300 feet+24 feet and 30 feet pillars; area of gangways 67 square feet; 1 working vein, coal from 30 to 60 feet thick, 4 veins on the tract; two 10 horse steam

fans; 2 safety roads; 300 horse power, 3 steam pumps; steam pump; 5 engines=470 horse; 14 boilers, 34 inches in diameter, 356 feet; killed none; injured by fire, 7; visits, 8; distance traveled, 208, in the mines 8 miles= 216 miles; area of grate, 192 square feet; 1 plane 550 feet long, 2 tracks= 1,100 feet, 1,000 feet outside tracks, in all 4,350 feet T rail of 25lb=34$\frac{1}{5}$ tons nearly; 225 men and boys employed; 8 mules; 30 wagons; outside temperature, 66°; temperature inside, 66° to 48°; speed of air at first visit, 5$\frac{1}{2}$ times, and last visit, December 10, 1$\frac{3}{4}$ times slow; 12 per cent. acid in water; capacity of shipment, 40 to 60 cars per day; condition of mines favorable; 25 per cent. of gas in this mine.

No. 5.—Colorado Colliery.

Inspected May 26, 1869.—4 *visits.*

Description.—I herewith submit a detailed statement of the above colliery as herein set forth. These mines were visited four times. The colliery is located 37 miles by rail and 18 miles by pike north of Pottsville, 2 miles east of Girardsville, on the estate of the heirs of Stephen Girard, known as Seitzinger's patch, leased and operated by H. L. Cake & Co. It consists of a drift colliery tunnelled south to the Mammoth vein, with gangways run east and west, and counter gangways in the upper lifts; the colliery is very extensive and some 60 feet higher than the water level; no gas in any quantity is found here; the section area of the gangways will=66 square feet; as the mines are worked over the level no engines or pumps are needed, and ventilation is carried on by air-holes assisted by check-doors, headings and battered schutes, mostly under the influence of the atmosphere, yet there is quite a good current of air and very little smoke. A coal plane is now in operation outside to relieve the hauling in the lower gangways; the mines must be valuable from the small amount of expenses incurred.

Gangway.—On the west lower gangway is in 2,400 feet, and 20 breasts working on it; the east ditto is in 3,000 feet, and 8 do. on it. The second west gangway is 2,700 feet, and the two east ditto, are in 2,700 each= 5,400 feet, and 1,800 feet of counter gangways, in all 6 gangways=15,300 feet of track; the tunnel is 500 feet, and about 1,680 feet of outside track, 48 inches gauge and 25lb rail=3$\frac{1}{3}$+miles, 130 tons T rail; some 30 breasts 30 feet+180 feet+20 feet each.

Ventilation.—All by air-holes out to the surface; no gas and very little smoke found; the drainage is complete.

Engines.—A 30 horse engine in use at the breaker, the fixtures and machinery of which is in good condition, and secured from the interferences of men or boys; 4 new boilers, 30 inches+26 feet=104 feet long; water good, and steam at 75lb; this is a common pressure on the valves. 1,025 feet one inch wire rope on the planes; area of grate surface 52 square feet.

Remarks.—The colliery is some eight years in operation, during which time no injuries occurred to miners; the upper works will last a long time yet, but the firm intend sinking a new slope which will be on the north dip of the Mammoth vein; when the slope is in full operation not less than 500 employees will be needed, and the colliery bids fair to last for 30 years.

Recapitulation.—6 gangways, 15,300 feet; 500 feet of a tunnel; 1,680 feet outside track, 48 inches gauge, 25lb rail, 3$\frac{1}{3}$ miles=130 tons T rail.

one 30 horse breaker engine; 4 boilers, 30 inches+26 feet, 104 feet long; 30 breasts, each 10+180+20 feet each; pillars 30 feet shut; 1 coal plane 550 feet long; 1,025 feet 1 inch rope; 358 employees; 29 mules; 70 wagons in use; the 3 veins=40 feet thick of coal; 6 escape safety traveling roads; outside temperature 80°, ditto inside 50°, difference 32°, on June 3. 4 visits, 3 by road=108, 1 by rail, 37 in mines, 8=186 miles; speed of air, 9½ times slow; gas, 5 per cent.; acid in water, 5 per cent.; condition of mine, very good; killed or injured, none. Officers, Ralph Oliver, boss miner; found him very competent and industrious; cars in full operation, 120; present, 86.

No. 6—Lost Creek Colliery.

Inspected May 26, 1869.

Description.—One visit by road 38 miles, in mine 2=40 miles. I submit herewith a detailed statement of the above colliery as herein set forth. This colliery is located on the estate of the heirs of Stephen Girard, leased and operated by H. L. Cake & Co. It lies near the Colorado colliery, 19 miles by pike north-east of Pottsville, and 6 miles east of Ashland, approached by a branch of the Philadelphia and Reading railroad, in the Shenandoah valley, some 3 miles west of that city. It is quite a new mine, consisting of a slope sunk 360 feet deep on the south dip of the Mammoth vein, at an angle of 65°; section area 24+20+9=198 square feet; two 6 feet tracks of 45lb rail; the wagons ride on the cages in this slope. The buildings are new, and the engines of the best in the county; a stepped traveling road in the slope to the bottom. I made a careful examination of the gangways, breasts, air and water-courses, manways and pumps, and found every thing in a satisfactory condition, except the cross-holes, they being too narrow, only 16 square feet section; they should be not less than 36 to 40 square feet section. I directed their enlargement at once, and the manager consented to do so; the pillars are holed every 18 yards up their length; the breasts 30 feet wide and run up 240 feet; these pillars are 24 feet thick.

Gangways.—The west gangway is in 1,860 feet and 33 breasts working on it; the east gangway about 2,000 feet and some 24 breasts working on it. The doors are placed on the gangways to check the air and force it up into the working breasts, and returns by the cross-holes in the pillars, sweeping through the breasts to the out-cast air shaft at the fan. All the gangways then open is 4,200 feet.

Ventilation.—The mine is ventilated by a 15 horse power Beadle steam fan 12 feet diameter, placed on the surface near the slope house, and receives steam from the slope boilers; the section or superficial area of paddles is 72 square feet; the slope is used for an in-take air-course; the air is split at the bottom of the shaft, and its sections run in east and west to the first check doors on the gangways; there it is forced into the working chambers as before described, and returns to the fan out-cast air shaft. Not much complaint of want of air in this mine, as every necessary improvement is rapidly making to keep the mines well ventilated.

Engines.—A 15 horse steam fan in use; a 60 horse pumping engine in the mines for drainage of two 8 inch columns, which gets its steam from the slope boilers, by a pipe laid down the slope; a two 60 horse hoisting engine for slope use; 2 drums 8½+12 feet long each, 11½ inch shafts; 6 boilers in 3 nests 30 inches+30 feet=180 feet; these boilers are cleaned twice

a year, and the water good. The tank is 60 feet higher than the boilers, and has a pressure to supply the boilers when steam is at 50lb on the valves. 900 feet $1\frac{7}{8}$ inch wire rope in use; power 60 tons; weight attached $5\frac{1}{2}$ tons; grate area 82 square feet.

Remarks.—The colliery is two years in operation, and as yet only one vein open; there is 5 veins on the tract; their aggregate thickness is 82 feet, with a run east and west one mile each way. I found the fan closed in on the wrong quarter, and it being 18 feet above the surface, I directed this to be changed so as to work more proper.

Recapitulation.—One slope 360 feet deep; 4 tracks 24+20+9=198 square feet section; 15 horse steam fan 12 feet diameter; 120 horse hoisting engine; 60 horse steam pump; 30 horse breaker engine of 3 boilers, 34 inches+25 feet=75 feet; 5 engines=225 horse; 9 boilers=255 feet; 64 breasts each 30+240+20 feet and 30 feet pillars; 5 veins 82 feet thick; area of grates 122 square feet; 3 gangways=4,200 feet; 800 feet outside track; 920 feet slope tract=5,920 feet T rail, 25lb $1\frac{1}{4}$+=49+tons; one visit by road, 38+2=40 miles; 60 horse pump; 900 feet $1\frac{7}{8}$ inch rope=60 tons weight attached, $5\frac{1}{2}$ tons; safety roads 2; air $4\frac{1}{2}$ times slow; outside temperature 82°, inside 52 to 34°; difference 48°; 225 men and boys employed; 12 mules and 50 wagons in use; 3 per cent. gas; 5 per cent. acid water. Condition of the mine good; shipping capacity 10,000 tons per month. Superintendent, H. S. Hay; boss, I. P. Rich, competent.

No. 7.—Girard Colliery.

Inspected May 27, 1869.

Description.—This colliery has received three visits. I submit herewith a detailed statement of the above mines, as herein set forth. The colliery is located on the Wild Cat run, one mile east of Girardsville, and 17 miles by road north from Pottsville, on the estate of the heirs of Stephen Girard; leased and operated by Col. J. J. Conner. Mr. Conner has the credit of being the first operator north of the Broad mountain, in the Mahonoy coal region. Much of the prosperity of that region is, in a great measure, due to his perseverance in demanding more ample facilities of transportation for coal; and being aided by such influential men as the late Burd Patterson, of Pottsville, Gideon Bast, John Bancroft and George S. Repplier. Mr. Girard penetrated the Mahonoy region, by railroad and self-acting planes, in 1835, and he opened mines in several localities, but more particularly in the valley at the foot of the new planes. Since his death, up to 1864, the whole Mahonoy region lay idle; and a new era has dawned in coal mining since 1842, when steam power was converted as an auxiliary in the room of all other modes to produce coal. In the latter year, the total coal produced amounted to 610,885 tons in Schuylkill county; and in 1868, the coal product of the county amounted to 5,116,129 tons. The colliery consists of some six drifts, with a great many gangways. There are two breakers in operation, and a new slope is soon to be sunk, which, when done, will constitute this colliery to be one of the very best in the county. There are three levels now working above water level, and coal preparing and transportation facilities are ample.

Gangways.—The west gangway on the Mammoth is in 5,040 feet; its sect. area=69 square feet; the east side is now closed in by accident; 102 feet of a tunnel; drove north to the Wild Cat vein. In this vein I found

considerable gas, in the form of fire-damp and white-damp. This gangway is in 5,280 feet, and only ventilated by air-holes, which are greatly influenced by the atmosphere. One hundred and two breasts have been opened on this gangway, only four of which are now worked. Skidmore gangway, on the lower level, is in 2,550 feet. There are 30 breasts on this gangway. The counter gangway runs in 900 feet, and has 12 breasts on it. The closed gangway is in 2,000 feet. In all, six gangways=17,872 feet, including the tunnels and top-level drifts, and some 2,100 feet outside tracks. The incline plane has two tracks, each 200 feet long. The aggregate length of T rails laid is=20,372 feet=4 miles=159 tons.

Ventilation.—Part of these mines is ventilated by a steam fan, placed 1,000 feet from the plane boilers. The engine is six horse power, and nine feet diameter fan. Mr. Conner contemplates erecting a large fan soon. I have examined the air courses, and find them not quite large enough, and have instructed their enlargement, and some more alterations in the line of the air columns and check doors, etc.; all of which are soon to receive due attention. No complaints being made by the miners of the condition of air, etc., I consider the colliery in a fair condition at present.

Engines.—A 25 horse engine runs the breaker; three boilers, 32 inches +28 feet long. We requested the engine-man here to keep the engine, boilers and machinery in a more cleanly condition. Sixty square feet grate surface; steam at 50lb; a 60 horse engine used at the coal plane, 16 inches +6½ feet cylinder; 8¼ feet diameter drum; four good boilers, 34 inches+ 28 feet=112 feet; grate area, 72 square feet; 550 feet 1¼ inch wire ropes in use; steam pressure in these boilers, at 72lb; No. 2 breaker; three boilers, 30+26.

Remarks.—There is some gas in the north gangway, and preparations are making to run the air-course to another avenue to the present fan, and open an air-hole out to the surface, to make it an intake, and conduct that air through the working breast on its passage to the fan, to change the fan cover so as to deliver the air better, and to close all leakages, and place a good pair of check doors on the drift. This will increase the draft through the working breasts. As all the mining is done above water level, and very little gas found, the ventilation is scarcely spoken of amongst the miners; and where the gas is evolved, there is especial attention given to that district. We have made three visits, and found the proposed reforms receiving attention.

Recapitulation.—The colliery consists of 6 drift gangways, 17,872 feet; 2,100 feet outside tracks, 48 inches gauge, 25lb rail=20,372 feet=4 miles =159 tons T rail; 2 breakers each having a 25 horse engine=50 horse; a 60 horse plane engine; a 6 horse fan ditto, and a 10 horse saw mill engine=5 engines=125 horse power; 12 boilers, 34 inches and 30 inches+ 26=274 feet long; grate surface, 160 square feet; 550 feet 1⅛ inch wire rope; 200 feet coal plain, 2 tracks; 3 visits, by rail, 74, by road, 68, in mines 5=147 miles; 8 escape roads; temperature 62° outside, ditto inside 56°, highest point, difference 6°; 108 employees; 16 mules; 70 wagons in use; shipping capacity, 100 cars per day; speed of air, 5¼ times slow; highest percentage of gas found, 10; ditto acid in water, 8; condition of the colliery fair, improvements taking place. Under the care of Mr. Conner, no doubt, the reforms proposed will be executed to satisfaction; none killed; July 12, Patrick Johnson injured by premature explosion of powder, John Hare by a fall of coal, Malachi Horey crushed between wagons; area of paddles, 72 square feet.

No. 8.—Pioneer Colliery.

Inspected May 28, 1869.

Description.—9 visits were made to this colliery, owing to it being the most dangerous mine in the region for explosive gas. I herewith submit a detailed statement of the above colliery as herein set forth. The colliery consists of a slope and 2 drift gangways, all of which run west nearly 10,000 feet each; it is located at Ashland, south of that town in the gap of the Mahanoy mountain, on the estate of John P. Brock & Bro., leased and operated by Messrs. Bancroft, Lewis & Co., which firm operated it from its commencement in 1853, their lease term expiring on the 31st December instant. It has the reputation of being one of the most extensive mines in the county. The slope is sunk on the north dip of the Mammoth vein 534 feet deep, 1 track, 6 feet gauge, 42lb rail. The Mammoth is the only vein mined on this colliery, though there are 4 other veins on the tract; all the gangways on the 4 lifts run west. The mines are drained by a 550 horse Bull engine, and the largest one of the sort in the county. It is reputed these mines to have produced 2,000,000 tons of coal during its term. Owing to the large amount of explosive gas evolved in this mine, every known method for ventilation was attempted but nothing satisfactory resulted from these experiments until the Beadle steam fan was resorted to, and then not so well until it was finally erected at and under the surface, when it then did effectually control the gas, and since then the great difficulty in the mines was nearly overcome. Now two such fans are placed side by side so that one can always be effective under any circumstance. I have managed these mines these last ten years, and am certain the explosive element here is as active and in as large a body according to the extent of openings as in any English mines that I am acquainted with, but since the substitution of the steam ventilator the mines can be worked with little or no fear, under the regulations I had adopted.

The machinery of the colliery is very extensive.

Gangways.—The slope gangway is in 6,600 feet, section area 85 square feet; the water level gangway is in 7,950 feet, section area 74 square feet; the middle level gangway is in 10,560 feet, section area 66½ square feet; the upper level gangway is in 3,960 feet, section area 65 square feet; the total length of the four gangways is 29,070 feet; the whole number of breasts worked is 303 each; average 33 feet wide+200 feet long and 40 feet high.

Ventilation is effected by two steam fans; the slope and water level is used for intakes; the Bull pump shaft from the water level is an intake; the areas of the air courses is 36 square section; a doghole or air course gangway drove on the level of the slope gangway along the bottom slate, and ten feet of coal left between the main and small gangway all the way to the face; a check door is placed on the main gangway at every breast, and cross holes drove from gangway to gangway, or the (doghole) check doors all open against the current of air, and the distance between them is so far as to admit a team and train to pass; the strong air current in the doghole is distributed into the working districts to supply fresh air there and dilute the gas; boys are stationed at the doors to see them open and closed; no lamps other than Davy lamps are used inside the first turnout, and a person placed inside the first check door whose duty it is to examine every ingoing lamp, and see that it be locked and otherwise safe; two day foremen and two night ditto are constantly on duty while the miner is working or idle, as danger is so imminent at any moment should

any neglect occur on part of officers or men, but whilst all things are working rightly the whole district of the mines can be approached with safety.

Engines.—Eight engines in use on this colliery. Breaker engine is a 30 horse power and runs 630 feet of beltings; 3 boilers 34 inches×20 feet long; 90 horse slope engine using 1,340 feet 2 inch wire rope; 6 boilers 36 inches ×36 feet long; 550 horse Bull engine; two 20 inch pump columns, each 400 feet long; 6 boilers 36×36 feet; 50 horse dirt plane engine; 1,700 feet 1½ inch wire rope; 3 boilers 34 inches×30 feet long; coal plane engine, 30 horse; 700 feet 1½ inch wire rope; 2 boilers 34 inches×40 feet long; 2 fan engines, each 10 horse=20 horse; 40 feet bills getting steam from slope boilers; the supply pumping engine 20 horse power; 40 feet belting; one boiler 30 inches×30 feet, and is located 1,600 yards down the valley. The tank is situated on the mountain, 380 feet above the level; the tank contains 10,000 cubic feet of water; the basin contains 30,000 cubic feet of water. All these engines, boilers, ropes and machinery are in good condition, and under the care of Swanson Eltringham, and acts as outside manager. 8 engines=790 horse power, with 21 boilers=692 feet long; 710 feet gum belting; 3,740 feet wire ropes in use; 12 enginemen steadily employed when in full operation; area of grates 294 square feet; 40 tons of coal daily consumed.

Remarks.—All the slope air-courses are 36 square feet section; the water level do. is 25 square feet section area; the second level air-courses are 20 square feet section area, and the fan out-cast shaft has a section area of 66 square feet; the coal is from 35 feet thick at the upper level to 60 feet thick in the level of the slope gangway; the vein dipping on an average of 65° north. It is supposed the coal will be found to exceed 150 feet thick in the basin. No mine in the county is more dangerous to work from the effects of gas, but its action on the coal makes it free to work; there is an immense amount of coal on the tract, and excellent facilities for mining and transportation, and an abundant supply of good water; the boilers are carefully examined and kept safe. The Davy lamps are the only lamps used in any of the working places in the mine at all times; the percentage of carburetted hydrogen is about 25 per cent.

Recapitulation.—One slope 534 feet deep north dip average 65°; 1 track 6 feet gauge, section area 16+14+10=150 square feet; 3 drift gangways; 4 lifts: 4 gangways 29,070 feet; 534 feet slope; 6,200 feet outside tracks, 48 inch gauge; 25lb rail; in total length of tracks laid is 35,804 feet×1,180 feet; car sidings, &c., =36,994 feet=7 miles=275 tons T rails. This amount of rails was renewed three times since the opening of the mines. 2 steam fans 10 horse power each; 8 engines=790 horse power; 21 boilers, 30+36 inches=692 feet long; 710 feet gum belting; 3,740 feet wire ropes; 294 feet grate surface; 40 tons of coal daily used. Killed or injured, none. 8 visits 26 miles each, 208, in mine 10=218 miles; 25 working breasts 32+200+60 feet each; 30 feet pillars; one 550 horse pump; two 20 inch columns; 400 men and boys employed; 30 mules; 80 wagons; 3 escape roads; outside temperature 78°, do. inside 62 to 66°; the speed of the air current in this mine is the standard fixed for the county, *i. e.* 18,137 cubic feet of air per minute; per cent. of gas, 25; per cent. of water, 20; condition of mines favorable; shipping capacity 80 cars per day. Officers—S. Eltringham, outside manager; Thos. B. Bancroft, resident member of firm; J. Eltringham, Jr., Thos. Simpson, Mr. Mann and Wm. Eltringham, first enginemen. All these officers competent. Thos. Eltringham, boss miner.

No. 9.—Preston Colliery.

Inspected June 27, 1869.

Description.—I submit herewith a detailed statement of this colliery, as herein set forth. The colliery is located at and north of Girardsville, on the estate of the heirs of Stephen Girard, Dr. Preston; leased and operated by Buckley & Moody. It is 16 miles north of Pottsville, by 'pike road. The colliery consists of a slope, sunk in the south dip of the Mammoth vein, at an angle of 40°, and 249 feet deep; section area, 24+20+9=198 square feet; having four tracks. The coal is 22 feet thick. The Skidmore vein is 600 feet north of it, and the vein 18 to 14 feet thick. I examined the engines, boilers and ropes of the colliery, and found them in good order. I inspected the mines, accompanied by a deputy from the mines, and the boss miner and foreman.

I found very little gas and a little powder smoke in one district only; the rest of the mines were tolerably ventilated. Some of the miners and loaders were a little hasty in not closing the canvasses on the draw holes, and some air-courses were partly, and some more totally, blocked up with coal. Any complaints about air had no very good foundation. The mines are ventilated by a fan.

Gangways.—The main east gangway is in 3,500 feet; eight working breasts on it. The Skidmore gangway, No. 2, is in 1,149 feet; it has 18 breasts on it; all the upper levels are worked out. The two gangways are=4,549 feet; the other gangways are=3,588 feet; in all, 8,137 feet, and 10,000 feet of track laid outside, which will make 18,137 feet of 44 inch gauge and 25lb rail=3½ miles, nearly=137½ tons T rail; 32 breasts working. The main gangway has 2,300 feet to go to the track line. The breasts are 30 feet wide and 285 feet long; the coal 24 feet thick.

Ventilation.—By air-holes; the slope is an intake, and the air split at the bottom; it passes in east and west; the manways are in the centre of the pillars, and cross-holes through to the top; the air passes in from breast to breast, and forced through air-courses to the outcast air-hole; the breasts have two schutes each, and canvasses on the draw-holes, to regulate the air; a dog-hole air-course is drove along the gangway, but this air-course is two small, only 12 square feet section; it should be 36 square feet section; the section area of the gangway is 66½ square feet; the manways in the pillars are holed into the breasts every ten yards up. This is a proper way. I directed all the air-courses to be increased, and a slant traveling road made out to the surface, and there to erect a steam fan. There is a traveling road at present, but it is a little inconvenient, and it is well to have two. The veins dip 40° south.

Engines.—Two 60 horse engines, 18 inches by 3 feet cylindars; two drums, 12 feet diameter and 10 feet long; 14 shafts; 660 feet 1½ inch wire ropes in use; a 25 horse breaker engine; nine boilers, 34 feet by 31 feet long; grate surface, 120 feet. I have examined the machinery of the slope and breaker, and found any dangerous places secured. The slope ropes are good.

Remarks.—I have visited this colliery three times, once on complaints being made by the miners; and after fully investigating the cause, after hearing parties, I found the outside temperature at 88°, June 27, and inside do. 54°; difference in favor of good ventilation, 34°. I examined the locality complained of, and found the loaders and miners both neglecting the air, by leaving the draw-holes on the schute open and the headings blocked with coal. I reconciled the parties.

Recapitulation.—One slope, 249 feet deep, section 24+20+9=198 feet; two 60 horse engines in use at slope; 25 do. at breaker; nine boilers, 34+31=279 feet long; grate surface, 120 square feet; 660 feet $1\frac{1}{2}$ inch wire rope; three visits, each 34 miles, in mines, 3=140 miles; four gangways, 8,137 feet; 10,000 track, 44 inch gauge, 25lb rails=$3\frac{1}{2}$ miles, nearly=$137\frac{1}{2}$ tons T rails; 32 breasts, 30+285+24 feet; four air holes; two safety-roads; three veins, 50 feet thick; one pole pump, 12 inch column; killed or injured, none; 305 employees; 25 mules; 50 wagons; shipping capacity, 150 cars per day; temperature outside, 88°; do. inside, 54°; difference, 34; air, $5\frac{1}{4}$ times slow; per cent. gas, 7; per cent. water acid, 10; condition of mines, favorable. Officers, Ab'm Williams, superintendent; Frank Smellzer, boss miner—all competent men.

No. 10.—Peach Mountain Colliery.

Inspected June 4, 1869.—1 *visit.*

Description.—I herewith submit a detailed statement of the above mine as herein set forth. This colliery is located at Raven Dale, 6 miles east of Pottsville and $3\frac{1}{2}$ miles east of Port Carbon, approached by a branch of the Schuylkill Valley railroad, on the estate of R. W. Lewis, Esq., and operated by G. D. Whitlesy & Co. When we visited this colliery it was closed in near the middle level by a fall in the roof; the miners were busy repairing it; I could not enter the mines; however I was informed of its condition, etc. I found the water dammed up in the middle level gangway; had a vent to allow it to pass to the lower level and thence pumped out when the slope was ready to work. The colliery consists of 2 slopes; the old slope is sunk on the Skidmore vein, 380 feet deep; 2 lifts, 4 track 22+19+8=164 square feet; the main west gangway is in 2,300 feet, the east 2,100 feet=4,400; the Skidmore tunnel is 389 feet long, the other gangways=4,789 feet; the slope tracks are 760 feet=5,549 feet. The new slope is 900 feet deep on a 30° dip south in the Mammoth vein; 4 tracks. This slope is 40 feet higher than the old one, and the coal passes to the breaker over a trestle work; the coal from the old one is drawn up to the platform on the incline plane, which is 130 feet long of 2 tracks; 1,000 feet of tracks in the new slope, and 1,800 feet of tracks laid in the slope is 2,800 feet, and 1,600 feet of outside tracks; aggregate lengths, 9,949 feet=$1\frac{7}{8}$ miles nearly=$74\frac{1}{7}$ tons T rail.

Ventilation.—A 6 horse steam fan ventilates this mine, which is to give place to 15 horse fan, and a fan of this size will effect good ventilation. As we could not descend in the mines we cannot vouch for the condition of the air.

Engines.—Two 60 horse engines are used in the slopes for hoisting and pumping; a 25 horse engine runs the breaker and works the coal plane; a 6 horse engine runs the fan; 15 good boilers in use, 34 inches+30 feet=450 feet long; surface of grate, 205 square feet; all the machinery and tackle is good except the old slope east rope; 3,040 feet wire ropes; steam at 70lb.

Remarks.—I directed a new rope to be put on the side in the old slope, as it was found rotten and broken, and therefore dangerous; also, to fence up the pump pit as it appeared very dangerous, and to shift the tracks so as to allow the wagons a safer outcome; the slope needed a good many sets of new timber, and several other improvements were recommended. Henry

Bogle was dangerously injured in the slope by being run over by a loaded wagon, he being called upon to signal to the engine man when the wagon got off the track, he slipped, fell and was run over. It was stated it was not part of his duty to do so, yet no provision was made for the support of his family, and now they become a burthen to the county.

Recapitulation.—The old slope is 380 feet deep, 4 tracks; the new ditto is 900 feet deep of 4 tracks; their section area, 22+1+98=164; 2 pump roads; 2 man roads; 4 gangways, 5,549 feet; one plane, 130 feet; outside tracks, 1,600, 2,630 feet other tracks=9,949 feet=1⅞ miles=74⅐ tons T rails, 25lb rail; 4 engines, 151 horse power; 15 boilers 34 inches+30 feet =450 feet long; 205 square feet of grate surface; 305 employees; 15 mules; 45 wagons; 2 safety tracks. Not being able to inspect the mines we cannot speak for their condition. Shipping capacity 80 cars per day, but could ship 120 when in full operation. Officers, manager, William Morgan; boss miner, William Walters, outside, Lot Evans; first engineman Ambrose Titus; outside temperature, 71°; inside ditto, 56°; in the middle level in the slope per cent. of gas evolved is 12; per cent. of acid in water is 8; 12 breast, 30, 200, 12.

No. 11.—Tamaqua Old Slope.

Inspected June 10, 1869.

Description.—I submit herewith a detailed statement of the above colliery, as herein set forth. This colliery is located north of the town of Tamaqua, east of the Little Schuylkill river, on the estate of the Tamaqua coal company; leased and operated by Whitstone & Wood. The colliery consists of a slope sunk on the south dip of F vein, 312 feet deep, at an angle of 56°. Its section area is 150 square feet. The location is very favorable. There are 160 yards of an air hole, and 40 yards of a traveling road on the west side, at an angle of 33°, which constitutes a safety escape road. This air course is carried 30 feet over the main gangway. There is considerable gas evolved in the western district of the mine, and it requires some care, on the part of miners as well as firemen, to prevent explosions.

Gangways.—The east gangway, on the lower level, is 860 yards in, and had no air hole on it. The west gangway, on the same level, is 860 yards in to a tunnel drove north to the E vein, and the west gangway, on the E vein, is in 900 yards inside the tunnel. This gangway is dry, and some 12 per cent. of gas is evolved, and very much smoke. The breasts are 10 yards, 20 yards wide, and the pillars 15 feet thick, and the mines on the west side are unhealthy. Thus 3 gangways.

Ventilation.—No fan or furnace is used, but air holes and some check doors, and much depends on the atmosphere. The ventilation is not sufficient to keep the mines in a proper way, and much sickness and suffering is the consequence.

Engines.—A 60 horse engine in use at the pumps; 2 pole pumps, 16 inches+6½ feet cylinder; a 50 horse engine, used for hoisting, 16 inches+4 feet cylinder; 8 feet diameter drum; 4 spiders, 8 arms each, 10 feet long and laid with 9 inch timber; a 25 horse breaker engine, 12 inches+3 feet cylinder; 3 boilers, 30 inches+26 feet long, and 6 ditto, 30 inches+30 feet long; thus 3 engines=135 horse power, and 7 boilers=210 area of grate surface, 90 square feet, all of which are in good condition. 750 feet 1½ inch wire rope in use.

Remarks.—The colliery is old and presents a worn appearance, inside as well as out, although there is a large body of coal. The colliery is very wet and a good deal of smoke and gas in the west gangway. However, the firm intend to erect a steam fan, which will relieve much of the present evil and effect a better condition of things. Efforts are making to enlarge the air courses and recover the waste air by closing up all leakages, etc., and increase the number of check doors and drain off the water.

Recapitulation.—One slope, 312 feet deep, south dip 56° ; 3 engines= 135 horse power ; 7 boilers, 30 inches diameter, 210 feet long, area fire grate 90 square feet ; 750 feet $1\frac{1}{2}$ inch wire rope in use ; 2 pole pumps in use ; 3 gangways, section area 66 square feet, 8,640 feet long ; 8 breasts, 30 feet +60 feet, and 15 feet pillars ; 3 visits by pike road=112 miles ; colliery 10 years in operation ; temperature outside 70°, ditto inside 64°, difference 6° ; 16 per cent. gas ; 10 per cent. choke damp, and ten per cent. acidulated water ; 66 employees ; 10 mules, and 35 wagons in use ; shipping capacity 30 cars per day ; 1,620 feet of T rail, 44 inch gauge of 25lb. rail, in all, including the slope tracks, 11,080 feet, 2 miles=$78\frac{1}{2}$ tons. Two persons killed : 26th July, Peter Conaghan, crushed in the pump bob pit, and August 24th, Thomas Bradbury, by explosion of powder. In both cases the company was exonorated from any blame. A decided improvement in repairing things generally has taken place.

No. 12.—Hartford Colliery.

Inspected June 9, 1869.

Description.—This colliery is located on the eastern limits of the borough line of Mahanoy City, 31 miles by railroad, in a north-eastern direction from Pottsville, on lands belonging to the late Burd Patterson, Esq., who was the first pioneer to open the Mahanoy coal region to the mining public. The town has now a considerable population, and a thriving place for business, and at present it is surrounded by some 25 active coal operations; the Big Mahanoy creek runs through its centre, which greatly adds to the sanitary condition of the place. The coal from this mine has many favorable advantages, as it can be transported by either the East Mahanoy, the Broad Mountain and Mill Creek railroad, or by the Quakake railroad, or by the Catawissa and Erie railroad. The Hartford colliery is leased and operated by Mr. William Patterson, it consists of two drifts, one east and one west, on the Mammoth vein ; these drifts are some 80 feet above water level and about 800 yards from the coal breaker ; the coal is hauled by mule teams from the mines to the breaker ; there are several good coal veins on the property, which will produce a large yield of coal for a number of years ; and under the practical management of Mr. Patterson, it is fair to presume that when slopes are sunk this will be one of the best collieries in the county. The colliery at present must be a paying one, owing to the small expenditure incurred, as the coal is produced without the use of shafts, slopes or engines, and this item alone is a large saving to the operator, and the drainage of the mines is effected by the grade of the gangways, which does not require the use of pumping machinery or its attendant expenses.

Gangways.—The west gangway on this level is in 840 yards; the east gangway on this counter level is in 800 yards ; the breasts on this level are 9 yards wide and 60 yards long, up a dip of 29°; the west gangway on the lower level is in 750 yards ; there are 15 breasts working on this gangway, each 55 yards long ; the pillars are 8 yards thick, and headed every 15 yards

up, with a main heading running at top from breast to breast; and all the gangways have a section area of 56 to 60 square feet, which is quite sufficient for mules and wagon way; there is a tunnel east of the breaker, on the Buck Mountain vein; the east gangway is in 800 yards, having an equal area as the west gangway; there are some 30 workable breasts in this mine; the main length of all gangways exceeds 3,190 yards in length; all the outside tracks will exceed some 1,560 yards in length; the total length of T rail tracks laid is 4,750 yards of 40 inch gauge of 25lb. rail; the water at this colliery is highly impregnated with mineral salt. The gangway timbers are in a good state of preservation and the drainage satisfactory.

Engines.—40 horse power engine in use at the coal breaker, giving full satisfaction; a cylinder 12 inches diameter by $3\frac{1}{2}$ feet stroke, the rods of which are $2\frac{3}{4}$ inches diameter; a 14 feet fly wheel, of 8 arms and a run of 5 inches+8 inches=40 square inch section, geared and used as a power pulley; shaft 9 inches diameter+13 feet long; a pulley 3 feet in diameter of 6 arms and 13 inch fan; shaft 6 inches diameter and 8 feet long; 3 good boilers, 30 inches diameter and 21 feet long=63 feet, with two water guages and one good safety valve, the beam of which is not stamped, carrying 40 pounds of steam; no hands within 30 feet of the boilers in case of an explosion. The whole machinery was built by Messrs. Carter & Allen, of Mahanoy City. Fire surface $4\frac{1}{2}+8=36$ square feet; no steam gauge in use; the boilers are cleaned four times a year. There are 64 men and boys employed in the mines, and 50 outside=to 114 hands in all; also 10 mules and 60 wagons.

Remarks.—The air is carried in by the gangways to their fans and conducted upwards through the working breast by headings in the pillars, the worked breasts being closed by plank batteries to force the air into the proper localities. In breast No. 18 the upcast air course is erected. The air in the eastern section of the mines is forced to the western works, ventilating all that part of the mines and thence returning to the upcast shaft, the area of which is $4\times4=16$ square feet section. There is a grate furnace in this upcast air hole. I directed the boss miner that the grate in this upcast air shaft should not be less in breadth than five feet between the stone walls of the furnace, and the same to be securely arched to protect the coal from taking fire from an atmospheric down draft or a neglect in not keeping the check doors in the gangways closed, or other causes. There is, as usual, some powder smoke but not of sufficient body to cause the miners to complain, or unduly interfere with their operation. Everything regarding their comfort is attended to as circumstances will admit of.

Recapitulation.—Number of gangways, 4; total length of gangways, 9,570 feet; total length of outside track laid, 4,680 feet of 25lb. rail; number of working breasts in the colliery then was 30 breasts; one 40 horse engine in use at the breaker; three 30 inch+21 feet boilers=to 63 feet long; 114 men and boys employed; 10 mules in use, and some 60 coal wagons; the capacity of shipments is at present 50 railroad cars per day; the colliery is in operation some 10 years, and all the coal produced since is all from some 80 feet above the true water level; the aggregate thickness of coal in the four gangways is equal to 40 feet thick, but the hauling distance is unfavorable at present; distance to the colliery and back is 62 miles; distance traveled inside and out, 5 miles; total length traveled is 129 miles; number of visits, 2 during the present year, etc.,=129 miles; temperature of the atmosphere, 60°; ditto inside ranged from 48° to 60°, varying as to distance and altitude; killed or injured, none; 2 escape roads; force of air, $4\frac{1}{2}$ times slow; condition of mines very good; $2\frac{3}{4}$ miles track nearly 119 tons T rails.

No. 13.—Delano Colliery.

Inspected June 10, 1869.

Description.—This colliery is located on lands owned by the Delano land company, and at present operated by the firm of Gorman & Winterstone; it is situate one mile east of Mahanoy City, and is approached by the East Mahanoy and Ashland railroads, and has an outlet by the Quakake or Catawissa and Erie railroads. The present operators have worked the upper levels of the mines, and are at present sinking a slope on the north dip of the Mammoth vein, 100 yards deep on a dip of 25°. Area of the section of slope is 18 ft.+15+11 feet high=181½ square feet. By this depth they intend to reach the basin of the vein, according to surveys made for that purpose. The colliery is in operation some 8 years.

Gangways.—A timbered gangway on the water level for receiving and discharging the slope water when in operation, which is 65 yards long. The east gangway on the water level is in 45 yards, and the west ditto is in 35 yards=85 yards on the upper bench of the Mammoth vein, which is 11 feet thick. The Buck Mountain vein is approached by a tunnel 270 yards long; east gangway is in 280 yards, the west ditto in 75 yards=355 yards; the coal is 9 feet thick, the breasts of which run up the dip of pitch of the vein from 40 to 70 yards, and are 10 yards wide; the pillars 8 yards thick; there are 90 yards between the Buck Mountain vein and the 7 foot vein; the coal here is from 7 to 9 feet thick; there is 200 yards of gangway drove on this vein eastwardly; the total length of all the gangways is 1,920 feet; length of tunnelings is=1,270 feet; aggregate length of track inside 3,190 feet; the number of feet of outside track of 40 inch gauge is=1,500 feet of 25lb. rail; total length of track laid is=4,690 feet.

Air course.—One air course on the Buck Mountain vein, 50 yards from the tunnel; there is no air course on the west side, but headings from breast to breast, which is forced to the eastern upcast; as the gangways are but short, and all above the water level, and this level nearly finished, it needs only little air, but the gangways must be preserved for future air courses, as the gangways on the slope level will require good means for ventilation.

Engines in use.—One 60 horse engine; a 15 inch cylinder and 6 feet stroke; rods 4 inch diameter, the connecting rod is 18 feet long; a 20 feet diameter fly wheel; 8 arms, 5½+9½ inches square in section of rim=52½ square inches; 3 feet pinion wheel, 8 arms, 12 inch face, teeth 2 inches deep; a 5 feet pinion wheel, 6 arms, 9 inch face; shaft 10 inches in diameter and 9½ feet long; drum 8 feet diameter and 11 feet long, 4 speeders, 6 arms, each lagged with 9½ inch oak planks; shaft 8 inches in diameter, 14 feet long. Two boilers, 34 inches in diameter and 28 feet long, in use 2 years; 2½ inch valve; 30 inch beam, not stamped, bearing 70 lbs. of steam.

One 14 inch pole pump in use. One 20 horse breaker engine; cylinder 9 inch+26 inch stroke; rods 2½ inch diameter; fly wheel 12 feet diameter, 6 arms, rim 4+7 inches=28 inches; section lagged with 2 inch plank, and used for a pully wheel; shaft 6½ inch+9½ feet long; a 5⅔ feet pully and a 4 feet pully on same, with gum beltings, for running the machinery of the breaker.

Two boilers 30 inches in diameter and 21 feet long; 2½ inch valve and a 24 inch lever, carrying 50lbs. steam. No steam gauges in use on either set of boilers, which should have them mounted to indicate the pressure on the boilers. Four boilers in use=108 feet long. Four hundred and fifty feet of 1¼ old wire rope, used for sinking the slope.

Remarks.—I found many of the wires of the slope rope broken, and condemned its use for future operation in the slope, but owing to the small

strain of about 2 tons at a time whilst sinking the slope, Mr. Gorman thought it sufficient strong for that purpose; that when the slope was sunk he would then re-place it with a substantial one. I found the air good in the mines, and but very little doing. I considered the air sufficient for the present. I examined the machinery of the engines and their condition, and found them all good and well taken care of by the enginemen in charge, Patrick Camfield and John Larkin, who are sober and competent men. The gangways are sufficiently large and the timbers in a good state of preservation, and the drainage good.

Recapitulation.—Two steam engines=80 horse power; 4 boilers, 30 inch diameter=108 feet long; 450 feet of $1\frac{1}{4}$ inch wire rope, (old;) 1,920 feet of gangways, and 1,270 feet outside tracks=3,190 feet of track; one 14 inch pole pump in use; 40 hands employed; 5 mules and 70 coal wagons in use, now robing out the top levels; distance to and back 60 miles; inside and outside the mines, $1\frac{1}{2}$ miles=$61\frac{1}{2}$ miles; number of visits 1, distance to and from 60 miles; outside temperature 74°; inside ditto ranging from 48° to 59°; greatest difference being in the tunnel=26°.

No. 14.—Norton Colliery.

Inspected June 11, 1869.

Description.—Distance from Pottsville and back is 66 miles by railroad. This colliery is located on the Delano land company's estate, north-east of Pottsville 33 miles by rail and 3 miles north of Mahanoy City. It consists of two drifts on the southern slope of the North Mahanoy mountain, 160 yards into the Mammoth vein. The colliery there are five workable coal veins on this lease: the Mammoth vein is 14 feet thick; the Church vein, 3 feet thick; the Skidmore vein, 6 feet thick; the seven-foot, 7 feet thick, and the Buck Mountain vein 14 feet thick; aggregate thickness of coal=40 feet; with east and west gangways on each=80 feet of coal all of which is above water level at present. The colliery is situated on the line of the Quakake railroad, which intersects the East Mahanoy railroad at Mahanoy City. The coal can be shipped to any market in the country from its present location. The colliery is newly put in operation and bids fair to become a very profitable one as there is a large body of coal on the estate.

Gangways.—The east gangway is drove in some 600 yards; the west ditto is in 550 yards, on the Mammoth vein=1,150 yards; the Skidmore gangway is in 200 yards; the seven-feet is in 23 yards, and the Buck Mountain ditto is in 36 yards; aggregate length of gangways worked=1,409 yards=4,227 feet, and about 800 feet of track laid outside, of 44 inch gauge, of 25lb. rail; total length of track laid=5,027 feet.

Engines in Use.—One 40 horse breaker engine, new, and all the machinery in good condition; 3 boilers 30 inches+24 feet long=72 feet, one valve; the water is good and the boilers considered safe.

Air Courses.—There is no need of a furnace or fan at present as there are no indications of any sort of gas; there are three air courses, viz.: 2 downcasts and one upcast. The west gangway air course is in the act of opening, and is up some 50 yards, but a recent suspension deterred its completion at this time, which is to be actively resumed in a few days. The air courses are drove through the headings to the face of the gang-

ways. No 13 breast is made a downcast air course; there are 4 air courses connected with the upcast air course.

Remarks.—I directed R. P. Jones, the boss miner, to erect a furnace on the surface, of sufficient area to warrant a sufficient draft in 100 yards from the drift mouth, on the east gangway, and a like furnace on the west gangway, for a better ventilation; and also desired him to keep good air in each gangway, as the extension of these gangways would soon need better ventilation. The breasts are 8 yards wide, and the pillars 4 yards thick. I required these pillars should be left 8 yards thick, for the better security of the surface work, and to prevent a crush. The breast is run up 60 yards, and the coal bury 16 feet thick; 4 yards is not of sufficient strength to prevent a crush eventually, as the air and age of the colliery may prove hereafter. I directed that the gangway should be crossed with the air course at the upcast, and carry it along and over the gangway, then hole it at the west and drive over that gangway an air course of an area of $4\times5\times4=18$ square feet. I found Mr. Jones a fit miner for the position, and have confidence in him to do and carry out my plans.

Recapitulation.—One 40 horse engine at breaker; 3 boilers=30 inches =72 feet long; 400 feet of 1-inch wire rope on plane at breaker; 4,227 feet of gangways; 800 feet of 25lb. rail or track; total length of tracks, 5,027 feet, 44-inch gauge; 14 working breasts in the mines; 110 men and boys employed; 9 mules and 40 coal wagons in use; temperature outside 74°, inside ditto, ranging to 50° and 62°; mileage, 68 miles; pitch of the veins, 36° south; shipping capacity=40 railroad cars per day.

No. 15.—Shanandoah City Colliery.

Inspected June 15, 1869.

Description.—I submit herewith a detailed description of the above colliery, as herein set forth. The colliery is located on the eastern limits of the Shandoah City, 33 miles by rail north-east of Pottsville, approached by a branch of the Quakake railroad, and also a branch of the Philadelphia and Reading railroad, on the estate of William Bower, Josiah P. White, Samuel Lloyd and Robert and Samuel Jordan, leased and operated by J. O. Rhoades, Esq., E. S. Silliman, trustee. This is one of the best mines in the county, as the thickness of the Mammoth vein here is some 300 feet. The slope is sunk on the south dip, at an angle of 20°, and 772 feet deep, having 4 tracks. The slope is used as a downcast air course, and, at the bottom, is divided into the different gangways by a tunnel from the slope south to the top plate of the vein. The coal is so thick that there are three east and three west gangways formed, and the breasts on each are formed one above the other in solid coal, still preserving the pillars regularly, one under the other, to avoid any crushing of the breasts. The air courses pass under these ganaways inward to their face, and use brattices in the gangway, and some along the pillars to force the air through the works, and these brattices are continued from breast to breast, with heading in the pillars at suitable distances to admit the air freely into the working districts of the mine.

Gangways.—The east gangway on the first lift has 10 breasts on it. There are 6 main gangways open on this colliery which will exceed 14,700 feet long, and about 2,000 feet of counters, etc., which will make 16,700 feet of all gangways. The body of coal is immense; not less than 100

breasts of coal open on it, each 30 feet wide+300 feet long. The drainage is very good, and very little gas of any sort is found in any part of the mine. Some of the breasts on this mine are open into the neighboring mines of Wm. Grant & Co.; the miners in each mine can signal or speak to each other. Area of the gangways is 71½ square feet.

Ventilation is effected by air holes which are entirely inadaquate to ventilate this mine properly. Mr. Rhoades is now driving air courses all through the mines, which will eventually communicate with an upcast air shaft, when he is to erect a 20 horse power steam fan, and until this is established there cannot be a full supply of fresh air brought into the mine.

Engines.—A 60 horse double acting pumping engine with two cylinders, 18 inch plungers and 6 feet stroke, columns 12 inch; two 50 horse hoisting engines, and a 40 horse breaker engine are in use at the colliery; 12 boilers 34 inches+30 feet long, all grate surface, is=150 square feet. All the engines and machinery are very good in all their appointments. I was promised, but failed to receive, a summary of the cost and materials in detail, which will come in in our next annual report.

Remarks.—I have found very little cause of complaint in the mines as the immense amount of coal that lies in the mines will afford tunnel gangways to be driven through any part of the mines; and I recommended a change be made in the air courses so as to shorten the volume of air and make the fan outcast air course not less than 70 square feet area.

Recapitulation.—4 engines=210 horse power; 12 boilers=360 feet; grate surface, 150 feet; 1 visit 74 miles; 8 years in operation; slope 772 feet deep; 2 lifts; 4 tracks; 1 vein 60 feet square thickness, 20° south dip; 16,700 feet gangway tracks, 5,475 outside track=22,175 feet T rail, 25lbs. =4 miles=158 tons; 271 employees; 16 mules; 60 wagons; outside temperature 71°; ditto inside, 50°; difference, 21°; shipping capacity, 100 cars per day; 5 per cent. gas; 5 per cent. acidilated water; condition of mines very promising.

No. 16.—Thomas Colliery.

Inspected June 16, 1869.

Description.—Keely Run slope is located in the northern part of Shenandoah City, on the southern dip of the Mammoth vein, 34 miles north-east of Pottsville by rail, and 15 miles north-west from Tamaqua; it is advantageously situated as a colliery, and commands a fine view of the town and valley, and is approached by all the roads in the Mahanoy valley; it has an unlimited deposit of the best sort of coal, several veins of which are on the property, with a full supply of good water, and so far there is no traces of any sort of gases. The slope is 130 yards deep, on an angle of 45°, the section area of which is=24+20+7½ feet high=166 square feet; there is two tracks of 44 inch gauge of 30lb. rail in the slope, with a 4½ feet pump road and a plank stairway, with a railing all through to the bottom. The workmanship of the colliery, in general, reflects great credit on the manager, Mr. Jonathan Wesley, Jr., who is a member of the firm of Jonathan Wesley & Co. The land is owned by the city of Philadelphia, which was granted and demised by the late Stephen Girard, of that city, as heirs in trust of said estate. This colliery promises to become one of the best in the county, owing to the large deposit of coal, the thickness of the veins, the total absence of noxious gases or vitiated air, and the very substantial

appearance of the mines. The buildings are all substantially built, and of ample dimensions; the coal is 48 feet thick in two benches, namely: the top and bottom benches, with a 3 inch to 18 inch parting slate separation, or a partition slate; there is a 2 inch diameter wire rope used in the slope; the breaking strain of which=65 tons; the weight of coal and wagon will not exceed 5 tons.

Gangways.—The west gangway is in 140 yards; the headings in the same are 7+6=40 square feet; there are 40 yards of a pillar on both sides of the slope to make it permanently secure. The breasts are generally 12 yards wide with 8 yards of a pillar; the breasts are 100 yards on the lower level, and each having 2 schutes; there are 28 feet between the gangway crossholes, area of which is=4+5½=22 square feet; the crossheads between the west gangways are 50 yards apart; the area of these gangways is 85 square feet. There are no gangway timbers used throughout the mines so far. The lower west gangway is in 480 yards and has 17 breasts working on it; the upper west gangway is in 480 yards with crossheadings between these breasts of 28 feet; area of this gangway is 76 square feet.

The chain pillar above the gangway is 8 yards thick, and the pillar headings are 6+5=30 square feet; there is 32 feet thick of coal above the slope timbers. The east gangway on the top level is 200 yards in; this gangway is 75 square feet area; there are 40 yards of a pillar left under the Shanandoah creek; the breasts working on this gangway are 12 yards wide, 90 yards long, at an angle of 33° dip; the south gangway near the top slate is 150 yards in; there is communication here with an air course =6+6=36 square feet, which will run some 50 yards and then communicate with the south gangway near the top; on this gangway there are 3 breasts left open, in case an accident might occur, to be used as an escape traveling road for the miners; there are jugular manways each side of these gangways; the total number of gangways is 5; length in feet, 4,350; 23 working breasts, each average 95 yards long; 5,475 feet of track, of 44 inch gauge, and 28lb. rail; aggregate length of track, 9,825 feet.

Air Courses.—The mines are ventilated by a furnace at the bottom of the slope of an area of 25 square feet, which is entirely too small for that purpose. The air course in the west gangway is 72 square feet; the headings are 42 square feet. The slope is the downcast air course; the air splits at the bottom of the slope and passes in the gangways to the face, returning through the crossheadings into the breast, airing and ventilating the same. I have condemned the use of the furnace here, owing to the large body of coal surface exposed, and advised the use of a suction fan in its stead. The air from the different gangways communicates in this upcast furnace shaft.

Engines.—The slope is worked by two 60 horse engines=120 horse power; 18 inch+6 feet cylinders; 11 feet diameter drum, 12 feet long; 5 spiders, 8 arms each, laid with 8 inch plank rods, 3½ inches diameter; 12 inch shaft 14 feet long; 14 feet diameter pinion wheel in the centre of the drum with a 14 inch fan, the teeth 4 inches deep. The engine is in charge of Wm. Perry, as engineman. There are 4 new 30 inch+30 feet long boilers=120 feet long. The valves and fixtures are well cased and carry only 80lbs. of steam. The water is good spring water. Fire surface 5½+12 feet=66 square feet. A 30 horse breaker engine, cylinder 10 inches+3½ feet stroke, receives steam from the slope boilers 400 feet off. The rods are 3 and 3½ inches in diameter; 12 feet fly-wheel; 6 arms run 4½+16 inches; geared for a driving pulley; shaft 6 inches, 9 feet long; runs 4 pulleys, runs 4 screens, 2 of 28 feet+5 feet diameter, and 2 of 10 feet+5 feet diameter. Three patched boilers remain in position if needed to be used

The water has a head of 174 feet perpendicular, at a distance of 1,740 feet the pressure of which forces water into the boilers when steam is at 48lbs on the beam. 3 engines=150 horse power; 7 boilers=180 feet long, perfect in all their appointments. A 20 horse fan is to be erected on the upcast shaft, thus making 4 engines of 170 horse power.

Remarks.—I directed a crosshole to be kept ahead of the headings so as to conduct a sufficient supply of air to dilute any vitiated air that might possibly collect in the face of these gangways, there being no apprehension of gas whatever at present, but it is well to have the air circulate freely through the mines. I found the temperature outside at 72°, and inside from 46° to 50°. 772 feet below the surface the pump fixture in use is a water cage which sinks into the sump and which is substituted for a pump, not having much need for its agency as the drainage at present is but insignificant. I measured the current of air in the main gangway, the volume contained 7,400 cubic feet, which moved over a given point in one minute. The result of this experiment proved very satisfactory. I advised the manager, Mr. Wesley, to erect a 14 feet fan on the upcast air shaft of 15 horse power, which would be sufficiently near the slope to receive steam from the boilers, which would be much cheaper and safer than the furnace mode of ventilation, and as the increased extension of gangways and air courses the fan system of ventilation will eventually be more reliable than any other system now in use. I also notified the men in charge of the slope to permit no more than eight men to ascend or descend in an empty wagon at any one time, and positively none to ride on a loaded wagon on any pretence. I have examined the engines and machinery in general and am pleased to say they are of the best quality, and kept in fine order and substantial in all their appointments.

Recapitulation.—4 engines=110 horse power; 7 boilers=222 feet long; 1,100 feet of 2 inch wire rope; 5,475 feet T rail track; 4,350 feet gangway track=9,825; distance to Pottsville and back, 68 miles; in and out of mines =3 miles; 71 men and boys employed; 10 mules; 60 wagons; shipping capacity, 70 railroad cars per day; air, 13½ times slow.

No. 17.—Plank Bridge Colliery.

Inspected June 25, 1869.

Description.—I herewith submit a detailed statement of the examination of the above colliery, as herein set forth. This colliery is located in the eastern limits of the borough of Shanandoah City, on land owned by White, Jourdan, Bowers and Lloyd, and leased and operated by William Grant, Lee & Co. It is situated on the line of the Quakake railroad, which is connected with the Mahanoy railroad, and has, in consequence, an outlet for transportation of coal to any market in the country. It is 33 miles distant from Pottsville, by rail, in a north-easterly direction, 4 miles, by stage north of Mahanoy City, and commanding a prominent position in that section of the county, from the enormous body of coal, and, under the experienced superintendence of Mr. Grant, the colliery cannot fail to become a source of great wealth to this firm, who are held in great respect with their employees, and their courtesy to this class of persons has gained for the firm a lasting reputation.

The colliery consists of a perpendicular shaft sunk 100 yards deep, with an east and west gangway radiating from the bottom of the shaft in solid

coal, the thickness of which averages from 40 to 60 feet, and owing to its great height it becomes a matter of especial difficulty for the miner to descry and detect the impending detached portions of rock or coal that momentarily threaten his life, whilst all precautionary measures are taken to secure the safety of the miners. This colliery can produce, under present circumstances, 100 railroad cars per day, and can be increased some 40 cars more a day. The average cost of the colliery is estimated at $150,000 00; the buildings are convenient and sufficient for the present amount of business done.

Gangways.—The shaft is 300 feet deep, 16+10 feet area of section. The east gangway is in 1,800 feet, with 30 breasts 10 yards wide, and runs up 270 feet each; the pillars are 8 to 10 yards thick. The west gangway is in 900 yards; 14 breasts of equal size and length; all the breast switches off from the gangway of wooden rails all through the mines; aggregate length of gangways on this level is=by adding 300 more feet, will equal 3,000 feet, and about 3,000 feet of track laid outside; the total length of tracks laid is=6,000 feet. 44 breasts, each 10 yards wide and 270 feet on an average.

Air Course.—The shaft is constituted a down-take air course, and is conducted at the bottom of the shaft into the east and west gangways by doors placed on them; the ventilation of the colliery is then conducted by an upcast air hole and a furnace, the draft of which is not of sufficient force to create a good ventilation at all times. Owing to the large quantity of powder used in blasting in the mines, a considerable amount of smoke is mingled in the air, which sluggishly hangs in different parts of the mine, which causes disagreeable uneasiness to the miners, whilst there is not sufficient draft to remove it quickly. The check doors on the gangways, with cross-holes in the pillars, are the principal means to be relied upon in sultry weather, whilst the cold atmosphere of winter acts more vigorously, and by its agency the air in the mines is much more in winter than in summer. So far, I have yet to hear of any complaints about air.

Engines.—One 60 horse hoisting engine, 15 inches+3½ feet; cylinder rods 2¾ inches diameter; 12⅓ feet diameter fly wheel; 6 arms; rim 5+7 inches=35 square inches; section 8¼ inches; shaft 9 feet long; drum 11 feet diameter and 10 feet long; 4 spiders, 8 arms each, laid with 7 inch timber; a 10 inch shaft 13 feet long; 9 feet diameter sheave pulleys, 8 arms each, with flanges 4 inches deep; 400 feet 1¼ inch wire rope, used for hoisting the water car, and 400 feet 1½ inch ditto, for hoisting coal wagons, and 400 feet 1 inch wire rope for hoisting on the coal plane at the breaker, in all 1,200 feet, dirt plane 1,000 feet; 2 boilers 36 inches+30 feet long=60 feet, 3 water gauges, all good, the boilers well cleaned carrying 70 pounds in ordinary work; one 30 horse (Duplane) engine, cylinder 10 inches+3 feet with one new boiler 36 inches+30 feet long, used on the dirt plane; the breaker plane rope is 720 feet long, making the aggregate length of wire ropes 2,920 feet long. A 40 horse breaker engine, cylinder 10 inches+3 feet, rods 2½ inches diameter, 13 feet fly wheel, 6 arms, rim 5+8 inches=40 square inches, section 8 inches, shaft 9 feet long; 2 boilers 30 inches+30 feet long=60 feet; 2 gauges; 1 steam gauge also; 2 boilers 36 inches+28 feet long=56; valves good and working at 60lbs. pressure on the valve; a drum 7 4/12 feet diameter, 10 feet long; three spiders of 8 arms each, laid with 6 inch timber; shaft 10½ inches+16 feet long. This engine runs 4 belts and 2 sets of rollers and 5 coal screens. Joseph Daddow and Henry Seets are engine-men.

Remarks.—Walter Gibbs and John Daddow are boss miners. John Atherton is principal engine-man. No pumps in use in the shaft, the

water being hoisted out by a car. It is a cheap mode of drainage, incuring but little expense. The ventilation, as above stated, is not quite satisfactory. I have advised the firm to substitute a 15 horse power Beadle fan and arrange check doors in the gangway, so as to force the air through the air course to the fan of the gangways and return by the cross headings, through the working breasts, out to the upcast air shaft; to open an escape traveling road in the east and west lower levels up through the old levels to the surface, to admit of sufficient space for egress in case an accident should occur in the shaft. I desire this course to be generally adopted at every mine in the county. I examined the breast where John Glinn was killed in, on May 7th, and after hearing the statement of John Connelly, his partner, who received an injury at the time, I agree with the verdict of the inquisition, that the said John Glinn came to his death by a detached piece of coal falling upon him and crushing him to death, and injuring John Connolly in his leg. Also, on the 16th of June, John Thomas, a miner 25 years of age, was killed by a similar fall of coal in the breast wherein he worked. And, also, on the 25th of June, Thomas Johnson was killed by a large mass of coal rolling down his breast, overtaking him in his retreat, and crushing him to death. In all the above unfortunate cases, and hearing the statements of witnesses, I agree with the verdict of the inquisition, that the above named persons came to their death by accidents, and exonorates the firm from further blame. Yet it must be remembered that a lack of judgment and prudence and an asperity of feeling in the foreman, very often imperils the employee and subsequently involves him in peril of life and limb, whilst other venturesome persons, for lucre, brave dangers, and some of an incautious habit often involve them in difficulties which they do not apprehend. However, it is satisfactory to know that all that can be done for the safety of the miner in these mines is done with a desire to better his condition and lessen his fears.

Recapitulation.—2 visits, 43 miles; 70° outside, 52° inside; distance from Pottsville and back, 66 miles; number of visits, 2=132 miles; miles traveled in and about the mines=134; depth of shaft, 300 feet; number of gangways, 3; lengths of ditto, 3,000 feet; length of outside track, 3,000 feet; 44 breasts, each 270 feet long, 30 feet wide and 20 feet average height; 1 furnace upcast air shaft; 3 engines=130 horse power; 7 boilers=206 feet long; one 15 horse fan proposed to be erected; 3 persons killed; 2 persons injured; 240 men and boys employed; 15 mules working at the colliery; 50 coal wagons in use; 2,420 feet of wire ropes in use; 10,650 feet of air courses in the colliery; shipping capacity, 100 cars a day; outside temperrture, 70°; inside ditto, 52°; difference, 18°.

No. 18.—Preston Colliery, No. 3.

Inspected June 18, 1869.

Description.—This colliery is located on the estate of the late Stephen Girard, of Philadelphia, and latterly owned by Dr. Preston, of that city, but the present owners are Messrs. Moor, Cook & Co., of Philadelphia; now leased and operated by the firm of Buckley & Moody. The colliery is approached by a branch line of the P. & R. R. R., and by the East Mahonoy, and also by the Broad Mountain and Ashland railroads. The slope is sunk 83 yards deep, on the Mammoth vein. It is situate 36 miles by rail north of Pottsville, four miles east of Ashland, and seven miles west of Mahonoy

City. It stands on the southern slope of the Locust mountain, and commands a central situation, at the junction of the Shenandoah creek with the Big Mahonoy, at Girardsville; which place is now a town of considerable note, surrounded as it is by some 16 collieries, several hotels, a post office, passenger depot, and a large population of thrifty people, whose busy axe and hoe have, by muscular labor and persevering industry, smoothed down the roughness of nature, and raised up for themselves homes, the abodes of comfort and happiness, the toil of years and savings of hard earned pennies. Unfit for society must he be, who would not look with pleasure on the noble efforts put forth by the toiling many who inhabit the uncongenial coal region, as wild as the mountains of Switzerland. The collery is in full operation these last 12 years. Area of slope is 24+20+8=176 square feet section; two 48 inch tracks and a four feet pump road. The land company are sinking a new slope, 200 yards west of the present slope, 100 yards below the level of the present one, and thence to tunnel, east and west, to penetrate all the coal veins on the property. This done, it then will become one of the best collieries in the county.

Gangways.—Herewith I append a detailed description of these gangways. The west gangway is in 3,500 feet, and has 540 feet to run to the boundary line; aggregate length is=to 4,040 feet; vein 22 feet thick; 8 breasts working each ten yards wide, and runs up a dip of 40° some 135 feet; 57 finished breasts, all the pillars are 8 yards thick; area of gangway =12+7+7=66½ square feet. Number two, Skidmore gangway, is in 1,142 feet; the breasts are the measures as above, and has still a run of 840 feet to the line. There is a traveling manway worked in the middle of a pillar to answer for an escape traveling road for the miners, in case of an accident; the pillars are holed out from breast to breast, and manways drove through the pillars every 10 yards up. The west gangway on the Skidmore has 2,300 feet more to run to the boundary limit; the Skidmore vein east of the tunnel, has 700 feet of gangway, with 13 breasts; the east and west gangways work with a run of 500 feet to the line. The tunnel is 390 feet and heading to the Skidmore vein; the aggregate length of gangways is, including 3,000 feet of upper level gangways=8,732 feet.

Air-courses.—The ventilation of these mines is principally effected by a suction fan, 6 horse power and 8 feet diameter, 3×3½ feet paddles, 6 arms=10½ square feet area; section area 630 square feet, making 140 revolutions per minute, whilst the engine runs 60 revolutions. The air-courses are generally too small, being 3½×3½=12¼ square feet; they should be not less than 36 square feet area of section; the air is poor in part of the works, whilst it is moderate in some more. The slope is made a downcast, and the pillars are holed out from breast to breast to admit the passage of the air to circulate freely in the working breasts, with manways through the pillars every ten yards up; the air is forced by stop doors in the gangways to pass into the face of the gangways and return through the breasts by the cross-headings in the pillars and thence to communicate with the out-cast shaft of the fan. This fan is too small to perform the necessary duties of ventilation, as the mines are getting more extensive.

Engines.—Two 60 horse power engines are used at the slope; cylinders 18 inches+6 feet stroke, 12 feet diameter; drums 6 feet long; 3 spiders; 8 arms, each laged by 8 inch plank; piston and connecting rods, 3½ inches diameter; 2 shafts 12 inches+14 feet long; a pinion 16 feet in diameter is placed in the centre of the drum, geared in a speer wheel of 14 inches face, the teeth 4 inches deep; the machinery is in good condition; 4 boilers 31 inches+35 feet long, in 2 nests; 2 safety valves and fixtures, carrying 130 pounds on the beam; fire surface 4½×18=81 square feet; the beams are

not stamped; 25 horse power breaker engine; 3 boilers 34 inches+31 feet long; these boilers are good and carry 80 pounds of steam on the beam; this engine runs 2 screens 4 feet in diamater and 28 feet long, ditto 2 screens 5 feet diameter and 20 feet long; all the fixtures of the breaker are good, and the machinery well protected to be secure against accident. 660 feet of $1\frac{1}{2}$ inch wire rope used in the slope, the breaking strain of which is equal to 35 tons; weight of wagon and coal, does not exceed 5 tons; the angle of dip being 45° south.

Remarks.—The slope is substantially built; the engines and machinery sufficiently strong; the fire surface is ample for the purpose; all the finished breasts should be well secured with plank batteries to secure them from leaking air, with self-closing doors on the gangways in proper locations to force the air in its proper channels so as to circulate freely and in a sufficient quantity in the working breasts; there is a large quantity of powder smoke sluggishly floating about in part of the mine, owing partly for want of circulation of proper air, and partly owing to the miners and loaders not keeping the canvasses on the drawholes; I had directed Mr. Williams's attention to this particular matter, which I afterwards was led to believe was not attended to; I visited this said colliery on the 6th of September to investigate the complaints of the miners; I found, in most cases, their allegations to be true, and I again visited the Red Ash mines as well as the No. 2 colliery, and again found the complaints of the miners in most cases substantially true; in both cases I have given the necessary instructions to Mr. Williams, and the mining boss, Frank Smeltzer, to remedy these grievances, and addressed a letter to the firm of Buckley and Moody on the subject of the complaints and the plan of ventilation; a disposition to remedy the evil was not evinced by the principal officer in charge, nor have I heard from the firm since.

Recapitulation.—Number of gangways are 4; the aggregate lengths are 8,732 feet; number of breasts working are 26; lengths up the pitch=135 feet; number of working veins, 2; thickness of coal, 32 feet; 4 gangways =64 feet thick of coal; number of downcast air-holes, 1, ditto upcast, 2, with 2 escape traveling roads to surface; 3 engines=145 horse power; 7 boilers=233 feet long; 1 fan ventilator; 305 men and boys employed; 16 mules; 70 coal wagons; distance from Pottsville and back by rail, 72 miles, in and out of mines, 3 miles=75 miles; 860 feet of outside track laid, 48 inches gauge, 25lb rail; thermometer stood at 72°, ditto inside from 58° to 67°, difference of temperature=14°; depth of slope, 249 feet; 660 feet $1\frac{1}{2}$ inch wire rope. Two visits, by rail 1, by pike 1, in mine 3 miles, in all 111 miles. Killed or injured, none.

No. 19.—Black Heath Slope.

Inspected June 22, 1869.

Description.—I herewith submit a detailed statement of my investigation of the above colliery, as hereto annexed. The colliery is located on lands belonging to the York and Schuylkill Co., and situate at the extreme western end of the Glen Carbon valley, on the southern slope of the Broad mountain. The colliery is now leased and operated by John Maginnis, of Pottsville. It is situated 11 miles north-west from Pottsville, and on the line of the Mine Hill and Schuylkill Haven railroad; approached only by that

line. The mines are worked some 13 years. The slope is sunk on the south of the Black Heath vein, at an angle of 45° dip, the section area of which is 22+20+10 feet high=221 square feet; two tracks, of 44 inch gauge, with a 25lb rail; a four feet pump road. The character and appearance of the roof evinces a tendency to decay. The slope is 285 feet deep at the bottom; the gangways turn off east and west. The appearance of the west gangway does not warrant it to be substantial. The vein is separated by a partition slate, some six yards thick, and holed at intervals, to admit the current of air to pass freely through the gangways. The outbuildings are in a moderate condition. The breaker is situate some 300 yards east of the slope. The coal is hauled to it over a trestle-work, some 25 feet high. The colliery is at present suffering from the effect of a crush in the west gangway; after which, and under proper management, could produce a considerable amount of coal.

Gangways.—On examination of the gangways, the grade at the face exceeded 30 feet, which of course was a loss in the lengths of the breasts; the two west gangways are in some 700 yards each; the breasts are 10 yards wide and 60 yards long, with seven to eight yards pillar, which are holed at intervals of 15 yards.

Ventilation is effected by air-holes and the air is in no way very satisfactory. The slope is used for a down-cast, and the air passed in west in each gangway, and thence up in the breasts by check doors, but the draft being too slow to ventilate properly, very much powder smoke prevails, and I have recommended the needful reforms; after which the west gangway closed in, and it took several weeks to re-open it, since which time I heard no complaints.

Engines.—A 50 horse slope engine, 16 inches by 5 feet cylinder, an arm of the fly-wheel is broken and spliced, and the plummer block under the crank end of the shaft is also broken and stayed; the cylinder shifts backward and forward at each stroke, and the condition of things are not favorable; a 16 feet wheel, 8 arms, rim 4 by 7 inches; 9 feet diameter drum; 4 spiders, 6 arms each, planked with 8 inch timber; 2 pinion wheels, 5 feet diameter; 3 boilers 34 inches by 30 feet=90 feet; 20 horse breaker engine in good condition; 3 boilers, 30 inches by 20 feet long, and the area of the two grate surfaces=78 square feet; 500 feet $1\frac{1}{4}$ inch wire rope in use; the east side rope poor to last long and dangerous.

Recapitulation.—Two engines=70 horse power; 6 boilers, 34 inches and 30 inches+20 feet+30 feet=150 long; grate surface, 78 square feet; 500 feet wire rope in use; visits, 2=46 miles; 10 years in operation; 2 gangways, 4,200 feet long; 12 breasts, 30 feet; 180 feet 24 feet pillars; 95 yards deep slope=285 feet; 4 tracks; 1 vein, 26 feet thick, (a split vein;) temperature outside 78°, ditto inside 54°; difference 24°; 2,200 outside tracks =6,400 feet; T rail; 44 inches gauge, 25lb rail; 125 men and boys employed; 9 mules and 30 wagons; 10 per cent. acid water, 10 per cent. black damp and smoke; capacity, 40 cars per day; no planes inside or out; air $7\frac{1}{2}$ times slow.

No. 20.—Furnace Colliery.

Inspected June 22, 1869.

Description.—Herewith I transmit a detailed description of the aforesaid colliery. The colliery is of recent construction, with two drift gangways,

running north to the Big vein, and there opening east and west on that vein, at an elevation of 50 feet above the water level, at the main line of the East Mahonoy and Ashland railroad, and approached by a branch of that road. It is 37 miles north of Pottsville, and six miles east of Ashland, six miles west of Mahonoy City, and nearly opposite the new planes. There cannot be much said of the colliery at present, as it is quite new. The estate is part of the property of Stephen Girard, and leased by his heirs to Atkins & Brothers, of Pottsville, proprietors of the Island furnaces and Fishbaugh rolling mills. These gentlemen intend using the coal in the production and manufacture of iron, at their establishments. So far, I discovered no traces of any sort of gas, and the appearances of things generally are favorable.

Gangways.—Area of the gangways are 12+6+7=63 square feet, and requires to be better laged, as the top rock is not quite solid. The first gangway is in 50 yards. The vein dips 45°. The second opening has two gangways; the east gangway is in 100 yards, and the coal is seven feet thick; the west gangway on this opening is in 50 yards. There were no breasts of any consequence open in the mines at this time; eight yards pillars.

Air-courses.—No air-courses as yet opened. I directed an air-course to be opened at the junction of the gangway, but on the west side, as it would be needed in the event of the extension of the colliery.

Engine.—A 20 horse power breaker engine, rylinder 9 inches+20 inches stroke; rods, $2\frac{1}{8}$ inches diameter; $8\frac{1}{2}$ feet fly wheel, six arms, 14 inch rim, used as a power-pully to run the screen belts; three screens, one 5 feet+22 feet long, one 5 feet+11 feet long, and one 4 feet+5 feet long; 5 inch shaft+9 feet long; five feet pully; two boilers, 30 inches+$30\frac{1}{2}$ feet long= 61 feet, with three water gauges, each three inch safety-valve; a 30 inch lever, not stamped; 70lb steam on beam. This engine runs a saw-mill, with its attachment, (Frank Hollowbush, engineer,) and a set of elevators; an iron stack, 45 feet high; all the machinery and fixtures complete.

Remarks.—I inspected this colliery on the 16th of June, to ascertain the cause of James Burk's death, as the verdict of the coroner's jury stated that he came to his death from negligence on part of the boss to furnish gangway timbers, in time to the miners to secure the situation, &c. I examined the place where James Burk got killed while in the east gangway, by a fall of coal from the roof; the measured distance from the face of the said gangway, to the nearest set of timber in the gangway, $17\frac{1}{2}$ (seventeen and one-half feet;) and after the statements of witnesses, and my examination of the place, I am of opinion, James Burk came to his death from the cause as above set forth. The east gangway is a sort of tunnel; the tracks are a 44 inch gauge and a 25lb rail; outside track about 500 feet.

Recapitulation.—One 20 horse breaker engine; 2 boilers=61 feet long; 4 gangways, aggregate lengths, 600 feet; outside tracks, 500 feet; total length of track laid, 1,100 feet; 65 men and boys employed; 2 mules, 12 wagons; shipments about 10 R. R. cars; temperature outside 73°, ditto inside 58 to 61°; 2 drifts; 63 feet section area gangway; 1 vein 12 feet thick, dip 35°; 3,600 feet to the line; 1,100 feet tracks, 44 inch gauge, 25lb rail=$\frac{1}{4}$ mile= $9\frac{2}{5}$ tons; 1 man killed, James Burke, June 16, for want of timber to support the top coal, whilst at work in the gangway.

No. 21.—Glen Carbon West Colliery.

Inspected June 29, 1869.

I herewith submit a detailed description of this colliery as herein set forth. The colliery is located on the southern slope of the Broad mountain, at Glen Carbon, and sunk on the south dip of the Big Crosby vein, on an angle of 56°. The slope is sunk 100 yards deep; section area 44+36+11=440 square feet. The land owners are Richard & Webster. The colliery is one of the oldest and most productive mines in the county. It is now leased and operated by Lucas, Dennings & Co. It is situated on the Mine Hill railroad extension to Ashland. The coal on the level of this slope is nearly worked out, and a new slope is now sunk to the depth of 100 yards under this old level. It is some 10 miles north-west of Pottsville, and 8 miles south of Ashland. This slope works the coal of 2 veins, i. e., the Crosby vein, east and west gangways, coal 14 feet thick; the Daniel vein, east and west gangways, 7 feet thick of coal. The south vein 6 feet of coal; these 3 veins having 6 gangways; the thickness of coal is =54 feet; the run of the veins is nearly 2 miles long. After the new slope goes into operation the old slope will be used thereafter for pumping purposes, and a good traveling road for miners.

Gangways.—The east gangway is in 4,800 feet, and nearly to the line, and all the coal worked out. The west gangway is some 4,800 feet in, and also finished. 30 yards east of the slope there are 45 yards of a tunnel drove to the south vein and worked east and west the same distance of the Crosby gangway=9,600 feet. The Daniel vein is 285 feet west of the Crosby vein, and the east and west gangways are worked some 9,600 feet in and nearly to the boundary lines Nearly all the coal in the water levels, as well as is this level, is worked out. All the breasts in this mine are 30 feet wide, 210 feet long; the pillars are 18 to 24 feet thick. There are at present 4 breasts working, and some skipping off pillars.

Air Courses.—At present the air is ventilated by means of furnaces, which are to be done away with as soon as possible, and a Beadle fan substituted. The air is conducted through the mines by means of check doors on the gangways and schute batteries, to the face of the works; then through the cross-headings in the pillars, from breast to breast, and returning through them and communicating at the upcast shaft. The main air holes are to be preserved and kept constantly in proper order to be used when the steam fan is in operation.

Engines.—One 60 horse hoisting engine; 2 pole pumps, one a 14 inch pump, the other a 16 inch ditto; 6 boilers, patched, but considered safe under ordinary care; fire surface, 4+18 feet=72 square feet; 720 feet $1\frac{1}{8}$ inch wire rope in use in the slope; drum 8 feet+12 feet long; 4 spiders, 8 arms each, laid with 9 inch timber; 10 inch+16 feet shaft. All the machinery and fixtures are in good condition.

Remarks.—One of the slope ropes is a new one, and the other is in use six years. There is a disposition evinced by the firm to put everything in such condition as will give general satisfaction.

Recapitulation.—One slope, 300 feet deep; two pump roads; two wagon roads, each 44 inch gauge; six gangways, 28,800 feet long; three veins of coal, 28 feet thick; 720 feet $1\frac{1}{8}$ inch wire rope; 30 men and boys employed; five mules and 30 wagons in use; capacity of the colliery, 16 cars per day. Killed—John Maloy was killed by a log rolling on his head, whilst in the act of unloading it. Eight per cent. gas, eight per cent. water acid, six per cent. black damp; temperature 71° outside, 52° inside; difference 19°; two visits, 43 miles.

No. 22.—Glen Carbon New Slope.

Inspected June 29, 1869.

Description.—This colliery is located some 60 yards west of the old slope, on the same estate as the old slope is sunk, and leased and operated by the same firm of Lucas & Dennings. The slope is sunk 600 feet deep, on the south dip of the Crosby vein, at an angle of 56°. As yet there are no gangways turned; area of section, 24+20+12 feet high=264 square feet; two tracks, of 48 inch gauge; one pump road, on the east side. The engine house and boiler house are fine stone buildings, with slate roofs, all of which reflect credit on the new firm.

Engines.—Two new 90 horse engines, one a hoisting engine and the other a pumping engine; eight new boilers, in four nests, 34 inches diameter, 24 feet long; grate surface, 5×22 feet=110 square feet; 900 feet of $1\frac{7}{8}$ inch new wire rope, for the use of the slope; breaking strain, 57 tons; 30 horse breaker engine, cylinder 10 inches+34 inches stroke; 12 feet fly wheel, eight arms, rim 5×7=35 inches section; $5\frac{1}{2}$ inch shaft, 10 feet long; four feet pully, eight arms, 16 inch face. The new drums are 12 feet diameter; six spiders, eight arms each; a 15 feet diameter pinion wheel, geared in in the centre of each drum. The engine is a link movement; the cylinders are 18 inches+6 feet stroke; 16 feet diameter fly wheel, eight arms, rim 5×9=45 inches section. Joseph Ormes is engine-man; John Evans, assistant; fourteen inch shafts, $16\frac{1}{2}$ feet long, five feet pinions. The drums are 12 feet long each, and laged with eight inch timbers.

Recapitulation.—First slope sunk 300 feet deep; four tracks; its section area 440 square feet. The new slope is 600 feet deep; both south dip, at an angle of 56°; of four tracks; two visits, 43 miles; fifteen years in operation; emperature outside 71°, temperature inside 52°; difference 19°; two slopes, 900 feet deep; three lifts; three veins of coal, 28 feet thick; six gangways; section areas, 66 square feet; length of gangways, 1,000 feet; 24 feet pillars; three engines, 210; eight boilers, 34 inches=192 feet; grate, 108 square feet; 900 feet wire ropes; 350 feet outside track; total length of T rails, 1,350 feet; 48 inch gauge, 25lb rail, $\frac{1}{4}$ mile, $9\frac{1}{3}$ tons; 20 men and boys employed; six mules and 30 wagons.

No. 23.—Peaked Mountain Shafts.

Inspected July 9, 1869.

Description.—This colliery consists of two shafts sunk within a few feet of each other, on the coal lands of Richardson & Webster, leased and operated by the firm of Lucas, Dennings & Co. The shafts are on the north slope of the Peaked mountain, or south side of the Glen Carbon basin; approached by the Ashland extension of the Mine Hill railroad. It is one of the oldest shafts in the county. The old slope is 90 yards deep now; the new shaft is 100 yards deep. There are several coal veins on the property and contains a large body of coal. The Big Daniel vein is 14 feet thick; the Little Daniel vein is 4 feet thick; the Crosby vein is 6 feet thick; the Leler vein is 5 feet thick; the Drain vein is 6 feet thick; in all the five veins the coal is=35 feet of coal. The veins dip south.

Gangways.—One gangway is in 900 yards, or 2,700 feet; 600 feet of tunnel on the west side, with two new gangways, just started; an inclined

plane gangway started in a breast some 240 feet. The aggregate length in this opening is 2,940 feet, and has still 1,500 feet of a run to the boundary line west. 14 breasts are now working on this gangway. The gangways are small, of an area of 42 square feet. The Leler gangway is in 2,550 feet, and has a run of 1,650 feet to the boundary line. The Crosby gangway is in 3,000 feet, and has a run of 1,200 feet to the line. The aggregate length of all the gangways is=8,490 feet; the distance still to run is=2,700 feet, and, by adding the inclined gangway, it will make the total distance of gangways=8,730 feet. The total length of outside tracks of 44 inch gauge is=2,100 feet, so the total length of track laid at the colliery is=10,830 feet.

Ventilation.—Very little can be said in favor of ventilation which is conducted under the influence of furnaces and air shaft, and the great distances to which it has to traverse. However, the firm is to adopt a fan.

Engines.—One 50 horse engine in use at the shaft; 13 inch cylinder and 4 feet stroke, rods 3 inches diameter; 16 feet fly wheel, 8 arms, rim $4\frac{1}{2}+8$ inches, 36 inch section; 10 inch shaft, 10 feet long; $8\frac{1}{2}$ feet pinion wheel; 20 inch spur wheel; $8\frac{1}{2}$ drum, 10 feet long; 4 spiders, 8 arms, laid with 8 inch plank; 8 inch shaft, 13 feet long; 780 feet of $1\frac{5}{8}$ inch old wire ropes in use; 2 new shaft engines, each 50 horse power, link motion, each 13 inch cylinder, 4 feet stroke, rods $3\frac{1}{2}$ inches diameter; $8\frac{1}{2}$ feet drum, 10 feet long; 5 spiders, 6 arms each; 8 feet diameter pinion wheel, 8 arms; 12 inch fan; 16 feet fly wheel, 8 arms, rim 5+9 inches=45 square inch section; a pinion 8 feet diameter, and one $2\frac{1}{2}$ ditto, 8 arms each; drum shaft $13\frac{1}{2}$ inches diameter, 16 feet long; one 5 horse donkey pumping engine complete; 850 feet new wire rope $1\frac{1}{4}$ inch, breaking strain 27 tons, and 850 feet new wire rope 2 inches=65 tons breaking strain; 9 new boilers, 34 inches diameter, 30 feet long; the water used in these boilers is good and the boilers are cleaned out every five weeks; no steam gauges used; steam 70lbs. on the valves; grate surface 5+26=130 square feet; 20 horse breaker engine; 2 30+30 boilers; 500 horse power Bull engine, 52 inches diameter cylinder and 10 feet stroke; 6 boilers 34 inches+30 feet long=180 feet; number of engines in use, 6 engines, 675 horse power; 17 boilers 510 feet long.

Remarks.—The company contemplate erecting a 20 horse power Beadle fan. I examined the machinery and engines, ropes, boilers, etc., and consider them fully competent for the work. The air is carried in the works as systematic as can be until the steam fan is put in operation. The working of the breasts and opening of the gangways is satisfactory. There is some powder smoke in part of the works which is not seriously complained of. The traveling road in the shaft is a ladder, but this is to be done away with and a traveling road for men and mules made out to the surface. The furnaces are to be removed and all needful changes made for the safety of men. The Bull engine is capable to accomplish the drainage of these mines, and there is a good traveling road up to the surface in that slope. Killed, none; injured slightly with premature explosion of powder in the gangway, when filling a cartridge. No gas of any sort is to be found in the mines.

Recapitulation.—Two shafts, one 100 yards deep, the other 200 yards deep; a 20 horse fan to be erected; 4 gangways=8,730 feet; 19 breasts working; 2,100 feet of T rail laid outside; total length of tracks in the colliery 10,830 feet; number of engines 6; horse power of ditto 675; 17 boilers, 510 feet long; none killed, 4 slightly burned; 325 men and boys employed; 16 mules and 60 coal wagons in use; distance from Pottsville and back 20 miles; distance traveled inside and outside of mines, 4 miles nearly=24 miles; number of visits, one; killed, one; temperature outside 82°; ditto inside 56°; 3 veins; 32 feet thick of coal.

No 24.—Mammoth Vein Colliery.

Inspected July 12, 1869.

Description.—I herewith submit a detailed description of my examination of the above named colliery as herein set forth. This colliery consists of two drifts. It is located on lands owned by Mr. John Fry, leased and operated by William L. Williams, and is at present operated by William Kendrick & Co. It is situated one mile west of Shanandoah City and 34 miles north-east of Pottsville, by railroad, on the southern slope of the Locust mountain, and approached by a branch of the Mahanoy railroad, and also by the New York railroad, having an outlet to all the markets. The drifts are open some 80 feet perpendicularly above the water level. There are 5 veins on this property, viz: the Skidmore vein, $6\frac{1}{2}$ feet thick; the Mammoth vein, 35 feet thick; the Buck mountain vein, 18 feet thick; the Seven-foot vein, 7 feet thick; the bottom vein of the Mammoth vein is 14 feet thick; the aggregate thickness of coal in the 5 veins is=$80\frac{1}{2}$ feet. By the way the Mammoth vein is separated by a partition slate 25 feet thick, both these veins are worked by one drift. 240 feet from the drift mouth the vein splits off, and 2 gangways run in westwardly parallel to each other, and crossholes cut at intervals of 50 yards from gangway to gangway. The inner gangway is in 1,556 feet and run out at its face to the surface; the outer gangway is in 700 feet; in all 2,256 feet; then the eastern gangway is in 300 feet and run out to the surface; the Skidmore vein is reached by a drift on the western run 450 feet in; total length, 3,000 feet. There are 34 breasts on the bottom gangway and 18 ditto on the top gangway of the Mammoth veins, and 5 breasts on the Skidmore. Of the 57 breasts there are some 11 breasts working, the remainder are finished, and are robing out the pillars and abandoning the upper level gangways.

Gangways.—There are 3 gangways. The bottom gangway is in 1,556 feet long; the bottom ditto in 700 feet; the Skidmore gangway is in 450 feet; there are 11 breasts working on the same. The breasts are 30 feet wide and from 30 to 50 feet long; the pillars from 18 to 21 feet thick. Total length of the gangways is 3,000 feet; area of section of the gangways= $10+6+6\frac{1}{2}=52$ square feet; section area of top gangway, $12+6\frac{1}{2}+7=66\frac{1}{2}$ square feet.

Air Courses.—The drifts are intakes, with air holes run in every 500 feet out to the surface and the partition slate crossholed at intervals of 50 yards; the pillars are holed all along, from breast to breast, and by check doors on the gangways the air is forced up into the upper works, and then circulates through the breasts and finally passes out at the outcast air hole. No fan or furnace used or needed on this level.

Engines.—A 15 horse engine in use at the breaker; 2 old steamboat flue boilers in use, one 30 inches+10 feet long, and the other 30 inches+14 feet long; the water gauges are ranged for 2 inch high and low water lines; then care should be taken in such case that the water be kept at a regular point in the boilers. Flue boilers are not much used at coal mines.

Remarks.—Had the colliery been first opened on the railroad, or water level, and tunneled northwardly so as to cut the five veins, the colliery would, in that event, become very valuable, and this course must, eventually, be taken to make it so; then hole out to the surface and erect a fan which will ventilate the whole of the mine. The slope is to be made the downcast, and split the air east and west. The breaker is in good condition, but owing to the breasts being worked out to the surface and mostly fallen in, this has caused the surface water to flow into the upper works

which will become troublesome hereafter. None killed or injured in these mines, nor is there any sort of gas found in them.

Recapitulation.—William L. Williams, William Kendrick & Co., operators; Thomas D. Ramsher, boss miner; Amos Snyder, engine-man; one 15 horse breaker engine; 2 boilers, 24 feet long; 3 gangways, 3,000 feet long; 600 feet of track, 44 inch gauge; total track, 3,600 feet; one breaker building; 11 breasts working; 53 men and boys employed; 5 mules and 14 wagons; daily shipments, 16 railroad cars; none killed or injured for the season; temperature outside, 72°; ditto inside, 46°; per cent. of gas, none; per cent. of water, 5; black damp, 6; 5 veins; thickness of coal, 80 feet; 34 breasts on the bottom gangway; 18 ditto on top gangway, and 11 ditto on the Skidmore ditto, each 10 yards wide and average 20 yards long; the pillars 15 feet thick.

No. 25.—Eagle Hill Shaft and Slope.

Inspected July 14, 1869.

Description.—I herewith submit a detailed description of my examination of the above named colliery, as herein set forth. This colliery is located on lands owned by Messrs. Mattison & Baber. The mine is leased and operated by James C. Oliver, Esq., it is situated on the eastern side of a branch line of the Schuylkill Valley railroad, on the Eagle Hill property, and is a long time in active operation. The colliery consists of a slope and shaft; the shaft is lately put in operation, it is sunk on the saddle of the Big vein, which is here separated by a partition slate; the top bench is 11 feet thick; the bottom bench is 12 feet thick=23 feet thick of coal. The buildings are quite extensive and well adapted to the purpose. It is about $5\frac{1}{2}$ miles distant from Pottsville, and $2\frac{1}{2}$ from Port Carbon, by rail. The coal is generally shipped by the Philadelphia and Reading railroad, and can also be shipped by the Schuylkill canal from Port Carbon; in this case in the line of tolls, it has an advantage of many other collieries in the county.

Engines.—A 50 horse engine in use at the shaft, and a 40 horse engine in use at the slope, a 20 horse engine in use at the breaker, and a 6 horse engine used to run the steam ventilator, and a 30 horse engine used at the dirt plane to elevate the coal dirt to the top of the bank, 5 engines=146 horse power; 12 boilers, i. e. 4 old ditto 30 inches+20 feet long, 4 new ditto 34 inches+20 feet long, and 4 new 34 inches+27 feet long=268 feet long, all of which are kept in good condition, well cleaned, and supplied with good water; 4 different wire ropes in use: shaft rope, 545 feet, $1\frac{1}{2}$ inches; slope rope, 459 feet, $1\frac{1}{2}$ inches; dirt plane rope, 450 feet, $1\frac{1}{2}$ inches, and the inside slope rope, 1,650 feet long, $1\frac{3}{8}$ inches=3,084 feet; the steam not carried above 90 pounds at any time.

Remarks.—I examined the shaft and say it should be lined as the rock and slate indicate traces of a rapid decay; the machinery, engines and boilers are tolerable good; the upper levels of the mines are somewhat the worse with age; there is a new slope sunk 35 yards east of the bottom of the shaft on a south dip some 450 feet long; here a stationary engine is used of 50 horse power to haul up the coal to level of the bottom of the shaft; this plane has two tracks and a pump road; the operator is driving an upcast air hole, 20 yards from top, to connect with the west side upcast, and are driving an upcast to connect with the fan outcast on the Big vein;

there is 40 yards of a tunnel drove south to the 7 foot vein; there is a tunnel drove between the top and bottom benches of the big vein; the second lift level is all worked out; I found no gas in the lower level; there is 35 feet of a solid pillar left standing each side of the inside slope, and an air hole open in its centre, up to the upper level which communicates with the regular air courses to the fan.

Gangways.—The new slope inside is 450 feet long, 2 tracks=900 feet. The west gangway on this lower level is in 90 feet; the north slope gangway, on the Big vein, is 1,800 feet long; the west ditto is in 840 feet=2,640 feet; the south tunnel, 120 feet long; both east and west gangways are in 600 feet each=1,200 feet; area of these gangways is 10+6+7=56 square feet section; east gangway on the lower lift is 120 feet in, and the west gangway is 85 feet in=205 feet long; area of section of these gangways is 11+6+7=60 square feet, nearly; number of gangways, 7; length, 5,035 feet long; 2 tunnels, 240 feet long; outside tracks and dirt plane=1,100 feet; total length of tracks in the colliery is=5,395 feet long; 2 slopes 777 feet long; shaft, 257 feet deep from the pulleys; the aggregate length of T rail laid inside and outside, on dirt banks and all, will make 6,172 feet; 24 breasts, 30+210 feet.

Recapitulation.—One shaft 257 feet deep; 2 slopes 777 feet long; 7 gangways 6,172 feet long; 2 tunnels 240 feet long; total length of tracks laid is=7,920 feet of 25lb. rail; 5 surface engines=146 horse power; 1 inside slope engine=50 horse power; total engines, 6=196 horse power; 12 boilers=268 feet long; 3,084 feet of wire ropes in use; 3 pole pumps in the colliery; 114 men and boys employed; 9 mules and 33 coal wagons in use; 2 men killed, William Clark, 65 years of age, wife and family; John Delany, 36 years of age, wife and 5 children; came to their death by being precipitated to the bottom of the shaft by the fall of a temporary platform, of their own construction, whilst removing a timber in the shaft. Injured, none; fans, 1; visits, 3; mileage to and back, 39 miles; miles in and about the mines, 3; total miles traveled, 39; temperature outside, 69°; ditto inside, from 50° to 66°; at the steam engine in inside slope, 107°; some gas in the middle level, east gangway; none elsewhere; shipping capacity, 80 per day; at present ships 40 cars per day; still improving things generally.

No. 26.—Windy Harbor Slope.

Inspected July 15, 1869.

Description of Old Slope.—I herewith submit a detailed statement of the above named colliery, as herein set forth. This colliery consists of two slopes, sunk on lands which are part of the Valley Furnace tract. Prior to this it was leased and operated by F. W. Hughes, but subsequently operated by David Oliver, and at present it is operated by Guitterman & Heebner. It is situated 5 miles north-east of Pottsville, 2½ miles north of Port Carbon, and is approached by a branch of the Schuylkill Valley railroad. The coal is transported over the Philadelphia and Reading railroad, and some shipped by the Schuylkill canal. The old slope is sunk 90 yards deep, on a south pitch of the Skidmore vein, at an angle of 40°. The area of this gangway is 23+18+10=205 square feet. The 5 gangways on this slope are nearly all worked out. There are 2 tracks, 40 inch gauge, and a 3½ feet pump road in the slope to the bottom. The coal is from 11 to 14

feet thick. The slope is to be used for pumping altogether, and also for an upcast air shaft, after the air courses are made for that purpose, and in condition the slope looks very good.

Description of New.—The new slope is also sunk on the Skidmore vein, and sunk 186 yards deep, on a south dip, 70°. All the slopes are sunk on the western boundary line of the territory, and the gangways driven eastward some 1,200 yards, and tunneled to the Big vein, and those west gangways are turned, coming west, to the territorial line of Messrs. Kirk & Baum's tract. The eastern run on this property extends $1\frac{1}{4}$ miles to the Silver Creek tract. A partition slate separates the north and south veins. There are 16 full breasts of coal standing full in the south vein untouched. The north gangway is crushed in and cannot at present be worked, but will be hereafter, as there is still a very large amount of coal remaining in the old works, which will pay very well when an apparent change is made in the coal market.

Gangways.—The five old gangways are nearly worked out, and generally closed with debris; also the tunnel to the Black Heath vein is closed, and so is the north and south tunnels. The Skidmore gangway east, is 400 yards in; the west gangway is driven 70 yards in; the east and west gangways on the north vein is driven in 300 yards each; the east and west gangways on the south vein is driven in two hundred yards each; aggregate length of the six gangways is=4,410 feet. Skidmore vein is 14 feet thick; the north and south veins are each 10 feet thick=20 feet; the Black Heath vein is 8 feet thick; the aggregate thickness of coal is 42 feet. There are some twenty-four breasts working in the colliery.

Air-courses.—An airhole is cut into the old slope, and the air is made to pass up the old slope some distance, and drove through a heading in an outside breast; there is an air-course made inside from the lower to the upper level, and is then to be continued up through an old breast and again holed into the old slope, and by this continuation of a main up-cast air-course, a 12 feet fan of 10 horse power will be sufficient to thoroughly ventilate these mines. There will be two check doors erected between the two slopes, and the fan placed on the old slope, which will be a complete out cast shaft, as the headings are 9×6 feet=to 45 feet section area. This done, and these mines will be one of the best ventilated collieries in the county; found no complaints about air or gas.

Engines.—One 30 horse breaker engine, $10\frac{1}{2}$ inches by 40 inches cylinder; 2 good boilers, 30 inches by 30 feet long, often cleaned out; two 40 horse engines are now idle, and one 60 horse engine is in use at the new slope; there are 13 good boilers in 4 nests, each 34 inches by 30 feet long; they have 2 steam pumps in the slope, one a 60 horse and the other a 40 horse power engine=100 horse. Mr. Thomas Doerley has charge of the engines, and found competent to act as such. There is 1,200 feet of $1\frac{3}{4}$ inch wire rope in use in the slope, and 630 feet of 1 inch wire rope used on the breaker plane; 2 drums, 8 feet diameter by 4 feet long; 2 spiders, 8 arms each in each drum; 2 pinion wheels 5 feet diameter each, 8 arms, 10 inch face; 1 pinion 8 feet diameter, 10 arms 10 inch face; a 16 feet diameter fly wheel, 8 arms of 6 by 8 inches rim, 48 square inch section; 2 pulley sheaves 8 feet diameter with 5 inch flanges; 2 shafts, 12 inches diameter, one 14 feet long and the other 16 feet long; all the machinery and engines are very good. James S. Winds is first engine-man. The second fly wheel is 12 feet diameter, 8 arms, rim 4×9 inches=36 inch section; also 2 screens, each 24 feet long by $5\frac{1}{2}$ feet diameter; 3 small ditto; 145 feet of gum belting attached; the general condition of the colliery is good.

Remarks.—The old slope is to be used for an up-cast air shaft; the dou

ble acting steam pumps in the slope receives steam from the slope boilers. It is thought that the slope of Messrs. Kirk & Baum underlies the present level of this new slope going west. The firm intend shortly to erect a steam ventilator on the old slope; this done, it will insure a successful ventilation of the colliery and also an escape traveling road for the miners, in case of any accident in the slope. There is 1,500 feet of track laid outside, 44 inch gauge, 25lb rail; a new breaker will shortly be built near the new slope and the old one abolished, and used for a fan up-cast air shaft, and a traveling road, as its condition is very good and substantial to last a long while.

Recapitulation.—There are two slopes, one 90 yards deep and the other 200 yards deep; 6 engines=260 horse power, with 15 boilers=450 feet long; 630 feet of 1 inch wire rope and 1,200 feet of $1\frac{3}{4}$ inch wire rope in slope=1,830 feet long; 5 coal screens in use, cleaning coal; 120 men and boys employed; 10 mules and 40 coal wagons; 4 coal veins—first the Skidmore, 14 feet thick, the North vein 10 feet thick, the South vein 10 feet thick, the Black Heath vein 8 feet thick—the average thickness of coal 42 feet; number of gangways, 5; the length of all the gangways, 4,200 feet; the length of outside track is 1,500 feet; total length of track laid is 5,700 feet; no person killed or injured; number of visits 1, miles 10; number of miles to Pottsville and back; miles traveled inside and outside the mines; temperature, outside 69°, ditto inside 56°; difference 13°.

No. 27.—Phœnix Colliery, No. 1.

Inspected July 16, 1869.

Description.—This colliery consists of a slope located at Phœnix Park, on the estate of Packard & Co., some 6 miles west of Pottsville, and is one of the oldest in the county; it was formerly operated by Mr. Charles Miller, of Philadelphia, and at present is leased and operated by Morgan Williams; it is approached by a branch of the Mine Hill railroad; the coal is shipped by the Schuylkill canal and Philadelphia and Reading railroad. The slope is sunk on the south dip of the Phœnix vein which is 7 feet thick, and dipping 25° south; the slope is sunk on the third lift; the present lift is 150 yards deep, the total 975 feet deep, and of a sectional area=20+18+8=152 square feet; has 2 tracks of 44 inches gauge, 25lb rail; 1 pump road in each lift; the air-course is 360 feet east of the slope bottom, and crosses over the top of the saddle of the vein, and thence along that saddle on the north dip and runs with that gangway; there is a plane 75 feet long on the west of the slope 3,000 feet from the face, and 3 breasts working here to meet the angle of the south and north dips on the old vein; and another plane 180 feet west, which is now idle. There is but little water in these mines. The mines are 24 years in operation.

Gangways.—There are 4 gangways in this mine; the north and south gangways are 60 yards apart, connected by a tunnel; the east gangway has 10 breasts working in it, and the north gangway has 11 breasts ditto; in all 21 breasts, each 10 yards wide and 6 yards long; 2,280 feet of an inclined plane on east gangway, on a dip of $3\frac{3}{4}$°.

Air-courses.—On the east gangway south dip the air splits, and this air course is 360 feet east of the slope and crosses over the top of the saddle of the vein, and travels with that gangway on the north dip to the face,

and travels through the breasts to the furnace, where there is a pillar 18 feet thick; here there is a large body of carburetted acid gas, and the improper manner in which the air is conducted, the furnace is not capable to create a sufficient circulation of the air to sufficiently dilute the gas and remove the powder smoke. The spontaneous production of both carbonic and carburatted hydrogen in this locality of the mine is quite considerable and eminently dangerous for miners to work in. I desired that two shifts should be put on the headings, to afford better facility for the passage of the air; a tunnel 60 yards long connects the north and south veins, and the air passes in this tunnel from vein to vein; and in these breasts the air contains about 12 per cent. of carburetted hydrogen, and 5 ditto of carbonic acid gases, with 30 per cent. of powder smoke, which makes the situation both dangerous and unhealthy; in breasts Nos. 7 and 6 the gas is very strong, and breast No. 3 cannot be approached from the gas; the safety lamps in this mine must be locked, and to use none but the best safety lamps. Mr. Williams is a practical man and will make the required improvements.

Engines.—One 40 horss hoisting engine, cylinder 16 inches+4 feet stroke; a 15 feet fly-wheel; 6 arms; rim $6\times7\frac{1}{2}=45$ square inches; section rods, 3 inches; 9 inch shaft, 8 feet long; $7\frac{1}{2}$ feet pinion wheel; 8 arms, 12 inches face; 8 feet drum; 4 spiders, 8 arms each; drum 10 feet long, laged with 10 inch timber; 9 inch shaft, 18 feet long; a 50 horse engine for pumping, 16 inches cylinder, and 5 feet stroke; rods $3\frac{1}{4}$ inches in diameter; 16 feet fly-wheel; 6 arms, rim 5+10 inches section; 9 inch shaft+8 feet long; 6 boilers 30 inches+22 feet long=132 feet long; no steam gauge; grate surface, 40 square feet; good spring water used; 1,950 feet 1 inch wire rope; 240 feet ditto on the dust plane; a drum 6 feet+10 feet; 4 spiders, 8 arms each, with 6 inches timber lagging; a 20 horse breaker engine in use for preparing the coal; all the screens and wheels are secured so as to avoid injuries to hands; 2 boilers 30+20 feet long.

Remarks.—This slope is at present sunk on the third lift, and is down to the bottom of the basin. The colliery has passed through so many different hands these last twenty-four years, that it tells forcibly on the mines generally. The colliery is ventilated by a simple furnace, which cannot at present be of much use, especially in summer, as the action of the heated atmosphere over-balances the atmosphere in the mines, and effects to establish an exciscans equilibrious state of air in the mine, in the absence of a more powerful expedient for ventilation; and there are some persons who still struggle with the old furnace system, although it is much more expensive, and here we will quote the old adage of "saving at the spigot whilst losing at the bung." I have forbid the use of any other lamps than safety-lamps in this part of the mines, and directed that all such safety-lamps shall be brought out every evening and handed over to a person whose duty it shall be to carefully examine, clean and lock them; and in the morning they shall be examined and tried and inspected by the boss miner before entering in the slope, and again examined by the fire boss inside in the mine; whose duty it shall be to daily report to the different miners the state and condition of the several breasts, gangways, schutes, headings and air courses, *and that each miner, laborer and driver shall first understand their several instructions before entering on their respective employments; that there shall be a book kept, wherein the numbers of each respective safety-lamp, and the person's name using it, and the name or number of the working place, and the condition of such safety-lamp, at each day, wherein it was used.* This precaution I proposed to Mr. Williams, who *promised that*

all these instructions shall be born out to the letter. No persons killed or injured during the year.

Recapitulation.—Slope, 975 feet deep; dip, 25°; two tracks, 44 inch gauge, 25lb rail; four veins—*i. e.*, the Phœnix vein, 7 feet thick; the North vein, 8 feet thick; the South vein, 8 feet thick; the Primrose vein, 6 feet thick; aggregate thickness of coal, 29 feet; number of engines, 3—a 45 horse hoisting engine, a 50 horse pumping engine, and a 20 horse breaking engine—aggregate, 115 horse power; eight boilers=192 feet long; 2,190 feet wire ropes; 100 men and boys employed; five mules and 60 wagons in use; distance traveled, to and back, 12 miles; do. in and about the mines, 3; number of visits, 2; temperature outside, 82°; do. inside, 52° to 30°; difference of temperature, 52°; number of gangways, 6; aggregate length of do., 6,860 feet; area of section, 60 feet; breasts working, 21; feet in width, 30; length, 180 feet; one furnace; some 15 per cent. gas; 30 per cent. powder smoke; none killed or injured; 960 feet outside tracks; per cent. of gas, 20 and 12; acid water, 12; speed of air, 19 times slow.

No. 28.—Phœnix No. 2 Colliery.

Inspected July 17, 1869.

Description.—I herewith submit a detailed statement of the above colliery, as herein set forth. This colliery is also located at Phœnix Park, on the estate of Packard & Co., and numbered and named as Colliery No. 2. It is now leased and operated by Messrs. George Johnson and William Dovy. It is situated contiguous to slope No. 1, on the western limits of the estate, about one mile west, and some seven miles west of Pottsville, and three miles south-east of Minersville. It is approached by a branch of the Mine Hill railroad. The slope is sunk 202⅓ yards deep, on a south dip of the vein, at the angles of 34½° to 39°, to 29°, to 24°, to 27½°, to 33°, to 35° and to 4½°; aggregate depth, 607 feet; area of section, 24+20+10 feet= 220 square feet. There is a movable track at the terminus of the second level; by raising or lowering this contrivance, the wagons are passed into either level as required. At present there are two miles of gangways in the mines; and taking the three levels, the gangways would exceed seven miles long. There are also 700 yards of outside track, of 25lb rail, 44 inch gauge; the aggregate length of tracks laid is=12,735 feet. This colliery has passed through the management of different operators, and the mines have suffered in a measure from this course, such as robing out gangway pillars and chain pillars, which, as a consequence, brings on crushes that endanger the future operations of the mines, to the detriment of the future lessee. I have noticed a very commendable feature in the management of Messrs. Johnson & Dovy, in part of these mines, in protecting such severe crushes, whilst there was no other expedient left them to secure the falling in of the roof, owing to the large openings left unprotected by props or pillars, which would lose to them a large amount of coal. They adopted of system of *crib-works*, of heavy timber, secured longitudinally, and filled with rock, the dimensions of which are 24+24 feet, and averaging 20 feet high, and some 26 in number; all of which were found fully sufficient for the occasion. A better plan could not be adopted, and much credit is due to them on this point. By such an expensive outlay, they have accomplished the security of the mine, and therefore placed it out of danger. Enterprises like this cannot be too highly recommended; whilst vast bodies

of the best anthracite coal in the county is lost, and such eventually become a public loss to all concerned. I examined the mines, and am able to say the operators are doing all they can do at present for the better regulation and ventilation of mines, and for the protection of the lives of their miners.

No. 29.—Phœnix No. 3.

Inspected July 20, 1869.

Description.—This colliery is located on the Phœnix Park estate, nearly adjoining the No. 2 colliery; some one-fourth mile south of it; is altogether a new slope. This colliery was also leased to Johnson & Dovy, and operated by them for some time very successfully, until meeting a rock fault in the west gangway, 100 yards from the slope. The new firm tunnelled some 15 yards of the rock; there is 35 yards more to pass through to the coal, on which there is 1,200 yards of a run to the limits of the boundary line. Meeting no encouragement from the land owners to assist them in driving through the rock fault, they abandoned the mines and suffered the slope to fill up with water, and a number of wagons and other materials, together with a full set of pumps, which will eventually yield to the corrosive action of the water. The east gangway is 315 yards in, and has a run of 1,600 yards yet to go to the eastern boundary line. The facilities afforded by this colliery for shipping coal was very encouraging, as there scarcely was no cost in the outside management of the work; the slope and breaker being so very near, that hauling was unnecesssry.

The two gangways are 415 yards long; the slope is sunk 195 yards deep; dip 27° south; area of section 25+20+7 feet=157½ square feet.

One 60 horse slope engine; 2 tracks, 40 inch gauge, and a pump road; a 40 horse double acting steam pump, 8 inch column; a 10 inch pump, 6 feet stroke; also a 20 horse breaker engine, for preparing the coal, and every thing connected thereto in the best order; 445 feet outside tracks.

Recapitulation.—Sixty men and boys employed when working; 3 engines, 120 horse power; 6 boilers 30+30 feet long; 4 mules and 20 wagons; miles to Pottsville and back, are 14; miles traveled about the mines 1=15; number of visits, 1; none killed or injured; capacity of shipment, 30 railroad cars per day; ventilation, none; depth of slope, 570 feet; 1,200 feet of 1¼ inch wire rope in use.

No. 30.—Maple Dale Colliery.

Inspected July 21–2, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. This colliery is located one mile east of St. Nicholas, near the line of the East Mahanoy railroad, and some two miles north-west of Mahanoy City, approached by a branch of the said railroad; the 33 miles by rail north-east of Pottsville; it is located on the estate of Dundas, Troutman & Biddle, of Philadelphia, and leased to and operated by Scott, Walters & Co.; John Beach, principal manager; Charles Beach, foreman, and Joseph Evans, boss miner. The colliery consists of 5 drifts and 1 breaker situate on a flat piece of land surrounded by rising grounds; the drifts

are on the northern and eastern sides of the breaker; the eastern drift is drove in a considerable distance to the vein owing to the lowness of the land, about 100 yards from the drift mouth; here the gangway turns off to east and west gangways; the first crosscut air course from north to south veins is 42 feet long; the air hole is made in the first breast from this crosscut; there is a door placed here on the gangway to check the air, and a boy stationed there whose duty it is to attend it; the pillars are headed every 20 yards up from breast to breast, and the air is carried through these headings to air the working breasts, and continue to traverse to the face of the gangway; there are two schutes to a breast, and batteries placed on them to confine the air to its proper locality; I found these batteries poorly secured and considerable powder smoke floating in this part of the mine; the pitch of the vein is 19°, and the coal 30 feet thick; the breasts run up some 120 yards; there are 150 yards from the face of the gangway to the air hole, and 250 from the face of the gangway, the cross-hole from the south to the north gangways; the cross-hole is not sufficiently large, it being only $2\frac{2}{3}+2\frac{2}{3}$ feet$=6\frac{1}{2}$ square feet; this cross-hole should be of an area of 36 square feet to secure a perfect air-course to ventilation; there are 2 air holes, 40 yards up, inside the turnout, of area of $5\times4=20$ square feet, and a hole in the parting slate of $5+6$ square feet, and a third air hole 70 yards up, of an area of $5\times8=40$ square feet; there are main doors here on the north and south gangways, and a fourth air hole inside; the south door is 100 yards up, and a furnace is erected on this air-course; the air travels to and back some 500 yards and passes up and out at this outcast air shaft, but the outcast being only 2 feet square, it is impossible for such an outcast shaft, with only a furnace draft to create a proper ventilation; the outcast should be not less than $5\times5=25$ square feet; breast No. 6 on south gangway is used as an air-cousse, and the door was brought to breast No. 7 at the cross cut; the second breast from this crosscut is 400 feet, and 600 feet from the face of the gangway to the junction of the two gangways; there are two breasts inside this door; 150 feet to the air-course inside the schute, and 233 feet and to the door, and no brattice used from the face of the north gangway to this crosshole, and only one battery, and that one at the crosshole. There are 6 breasts working from this door to the junction, 618 feet to the inside air-course at the furnace; there are 400 feet from the furnace to the second air-course; all the pillars are whole to the airhole outside the turnout.

July 22, 1869.—Inspected the Seven-foot vein gangways. The dip of the axis is $13\frac{1}{2}$°, and is in 290 yards. There are 9 breasts on this gangway, 4 of which are finished. There are 3 air holes on this gangway; area of the tunnel is 33 square feet. The stack that is to be presently erected must have a section area of 25 square feet. I here found considerable powder smoke, and directed the outlets made larger to admit a better supply of air in the north and south gangways, where the two veins meet, each of an area at least of 36 square feet, with a door on the main gangway to force the air forward, and to double this door at a distance of 200 yards, to allow a proper distance for teams to pass, and the doors to be so fixed on their hinges as to allow their closing at will, and the breast outside the outcast shaft to be driven out to the surface, and use it for a downcast shaft, to ventilate the mines at this place. The inside cross-cut from north to south gangways should be enlarged, and such cross-cuts to at least 100 yards apart, and of an area not less than 36 square feet; the schutes to be made smaller, with canvass doors on all the drawholes, and a penalty of $5 00 fine charged for any neglect of this order, as it is highly detrimental to the health of the miners and workmen to neglect it. On slant gang-

way, No. 2, I directed an air hole to be drove to the surface, owing to too much powder smoke being confined in it, and a furnace erected thereon. I advised the boss miner, Mr. Evans, to clear away the fallen *debris* in the passage of the air course so as to freely admit of a sufficient portion of air to circulate in the mines, that would effect a better ventilation; and all air course to communicate with this upcast shaft.

I also directed two doors to be placed on the tunnel, and to open the first air hole on this for a downcast air shaft, and to use two upcast air holes, each to be 5½ feet square, and all air communication made to this furnace, the schutes made smaller and batteried with canvas doors ont he draw-holes, and have them secured, and a good manway made for the miners to travel in for safety, of an area of not less than 16 square feet, with sufficient timbers constantly supplied, in proper and convenient places, for the use of the miners, to use when and where, as seems to them fit, for their protection. All and every of these instructions were given to Mr. Evans in presence of Joseph Branan, as deputy for the miners of this colliery, and he being instructed to the end that any neglect on the part of Mr. E. to carry out his promises and to fulfill them, he should notify me of such neglect.

Engines in use, only one 40 horse engine; this runs a saw mill and hoists the wagons from a level, as no other motive power is as yet needed, whilst the mines are confined to these drifts; a 16 feet fly wheel, 8 arms, rim, 22 inches; fan used as a belt pulley, running a 14 inch belt; a 12 inch shaft, 12 feet long; grate surface=160 square feet; 6 boilers, 30 inches+20 feet long, all new, and using good water; runs at 60lbs. steam; 120 feet of 1¾ inch wire rope, and raises 30 wagons an hour. The daily capacity of this colliery is 125 cars per day.

Recapitulation.—13,270 feet of tracks laid in the mines; 7,325 feet of track laid outside; aggregate length of tracks in the colliery is 20,595 feet of 25lb. T rail=4 miles nearly; 220 men and boys employed; 27 mules and 3 horses, with 60 wagons. No persons killed or injured this year. Number of visits, 2; distance traveled, in the mines, 4½ miles; to Pottsville and back, 64 miles; 2 visits=132½ miles. The ventilation is to be put in good condition, and the security of the miners carefully attended to. I found a creditable good feeling existing between the employers and the employed; miles traveled, 172; 9 years in operation; temperature, outside, 82°; ditto, inside, 51°; difference, 31°; 5 drifts; 10 tracks; 5 veins; 48 feet of coal; 2 furnaces; area gangways, 65 square feet; 40 breasts, 30+200 feet; 5 up, and 5 downcasts; air, 9½ times slow; 20,595 feet track, 4 miles, 159¼ tons T rails; 10 per cent. black damp; shipping capacity, 120 cars per day; 2 killed; 2 injured.

No. 31.—Pine Forest Shaft.

Inspected July 24, 1869.

Description.—This colliery is located on the eastern limits of the town of St. Clair, on western side of the Crow Hollow branch of the Schuylkill Valley railroad, and some five miles north-east of Pottsville, on lands owned by Wetherel & Seitzinger, and leased and operated by George W. Snyder, Esq., founder and machinist, of Pottsville. Owing to its contiguity to the shipping docks at Port Carbon, and the short route, the tolls are quite low, which makes the mines the more valuable. The machinery

and engines, and the appurtenances of the colliery, cannot be excelled in the county. Owing to Mr. Snyder's great experience as an operator and founder, together with the assistance of Thomas Maguire, boss miner, John M. Morrison, outside manager, Benjamin Howard, machinist, there can be no doubt the colliery will be made a paying concern. Much credit is due to the employees, for the good feeling evinced towards their officers; and in this case it is fair to presume the conduct of business is on a sound footing. The colliery consists of a shaft, 100 yards deep, and partitioned off into two compartments. The wagons are hoisted on a self-unloading cage. The tower is elevated 80 feet above the shaft. Everything out of the shaft is directly under the eyes of the engine-man, Joshua Crawshaw, so that there is no apprehension of danger. The cage is now supplied with a cover, to protect those descending and ascending the shaft. The shaft is supported on the eastern side by a 100-yard pillar, and at this point a tunnel is driven south, 43 yards from the Mammoth vein, to the Seven-foot vein. At this point a door is erected in the gangway, to turn the course of the air, and a door on the air-course to the Seven-foot vein. Cross-hole and cross-headings all the way, to conduct the air to the face of the work. The two upper levels are all worked out to the surface. Area of the Big-vein gangway is $13+6\frac{1}{2}+7\frac{1}{2}=73$ square feet; 243 yards from the slope to the face of the gangway. There is a considerable quantity of gas evolved in the face of the gangway and breasts, so that it is necessary and expedient to use no lamps but the Davy safety-lamps. The outside temperature was 71°, whilst inside it ranged from 58° to 68°; difference being only 3°; and the mines are quite dry. There are seven breasts open. The seven-feet gangway is in 2,802 feet on the east lower level. A door is placed in the Big-vein gangway, inside the tunnel, which drives the air up the schutes into the cross-headings, and is made to traverse the headings to the face of the work, and return back, west, to a cross-hole in to the Seven-foot vein, and is there made to traverse the Seven-foot works, and the same air is made to air the bottom level of the Seven-foot vein works, and thence pass up to the counter gangway, and thence return to the outcast air shaft, at the fan. The breasts are eight yards wide; the pillars are from 10 to 12 yards thick; the coal is 18 feet thick in the Big vein; the cross-hole is 49 feet from timber to timber, and 35 feet from vein to vein, with that partition slate running parallel with both veins uniformly throughout. The average dip of axis is from 30° to 40°. The breasts' average length run up 60 yards each. The ventilation of the mines is effected by a 20 horse power fan, erected over the junction of the seven-foot tunnel and the Big-vein gangway. The seven-feet gangway is in 980 yards+120 do., =1,100 yards, 980 yards gang.

Engines.—A 250 horse power engine pumps in the shaft, 60 inches+10 feet cylinder; one 20 inch pump working, and a 20 inch pump ready when needed; a 10 horse donkey to supply the boilers with water; the head of water has an elevation of 200 feet, which charges the boilers when the steam is at 50lb; two 85 horse engines used for hoisting in the shaft, 30 inches+4 feet cylinders, link motion rods, $3\frac{1}{2}$ inches diameter; 2 cast iron drums, 12 feet diameter, a grooved face 34 inches broad; a 15 feet diameter pinion wheel, geared in the centre of the drum; 5 feet spur driver, each having 8 arms; 14 inch fan; 12 inch shaft, 14 feet long; 10 inch shaft, 8 feet long; 656 feet $1\frac{3}{4}$ inch wire rope on east drum, 18 months in use and good; that on the east drum is one year in use—total length=1,312 ft. long; 10 boilers in 2 nests, 36 inches by 37 feet long, with steam drum and cast iron bridges to support the weight of the boilers, and good safety valves; all cleaned once in five months; the water is good; also 4 additional boilers,

34 inches by 30 feet long, supported as the others; area of fire surface 5+42=210 square feet; a 15 horse fan engine, 12 feet diameter; fan 80 revolutions, can run 130; dirt plane engine, 40 horse; two 7 feet drums; the plane is 600 feet long; 2 wire ropes, 1¼ inch each, 700 feet long=1,400 feet; there are 3 reservoirs to supply the colliery; a 40 horse breaker engine to prepare coal; 4 boilers used at the dirt plane, 34 by 30 feet long; number of engines, 67; aggregate horse power, 528; number of boilers 18—total length, 610 feet long; breaker, 14 feet fly wheel, 8 arms, rim 6+8 inches+48 inch section; 3 inch rods; 9 inch shaft, 16 feet long, 4 pulleys geared on it, running 4 gum belts; one 50 feet by 16 inches, two 30 feet by 60 feet, and one 30 feet by 16 inches.

Remarks.—I directed the lamps all to brought out each evening, and given in charge to a proper person to examine and clean them; each lamp having its respective number entered on a book kept for that purpose, and the person's name using it; and that the fire boss, whose duty it shall be, should examine each and every lamp each morning, before the person using the same should enter his respective working place, after first the fire boss would give him notice of the condition of the locality; that any infraction of these rules, for the safety of the lives of those in the mines, should, for the first offence, be a fine of five dollars, and a second breach of the rules, be his expulsion out of the mines. I have given strict charge to keep the canvasses closed on the draw-holes, and that no other batteries be used, except double plank batteries to prevent the leaking of air from the ravages of rats or other disturbances; also I directed that the gangways should be drove 100 yards ahead of the breast, so as the return air should sweep out the gas and vitiated air in them. The engines, boilers, machinery, and the whole establishment reflects great credit on the officers in charge. I directed suitable escape traveling roads for the safety of miners, in case of any accident to the shaft; and at my second visit, October 27, I found to my satisfaction there were two good, and soon would be three proper traveling roads out of the mines, one of which would be for men and mules. All other necessary instructions given, are receiving due attention; hose carriages are on hand for service, and a place for every thing and every thing in its place. The gas is not as yet in too large a body to create any serious fears, but the strictest vigilance is demanded for the safety of life and the security of property. The run on this tract exceeds 1½ miles east, and 1¼ miles west.

Recapitulation.—Seven engines in use at the colliery, aggregate horse power, 528; 18 boilers, total length, 610 feet; 254 men and boys employed; 19 mules and 60 wagons; 2,712 feet wire rope in use; grate surface, 270 square feet; 2,500 feet of outside track laid with 28lb T rail; about 4,200 feet of track laid inside=6,912 feet of track; none killed or seriously injured this year; temperature outside 71°; ditto inside 58° to 68°; number of visits, 2; distance traveled, 23 miles.

No. 32.—Otto Slope, White Ash.

Inspected July 26–7, 1869.

Description.—I herewith submit a detailed description of my inspection of the above colliery, as herein set forth. This colliery is located at the new mines, 8 miles west of Pottsville, 4 ditto south-west of Minersville and 12 miles west of Schuylkill Haven; approached by the Muddy Branch

railroad, which is a branch of the Mine Hill railroad. The slope is sunk 250 yards deep, on lands owned by the Forest Improvement company, and leased and operated by Messrs. Cain, Hacker & Cook, of Philadelphia; managed by Thomas Schullenberger, as agent; Mr. George, as boss miner, under whose experienced hands, no doubt, the mines will not deteriorate from their former reputation. The first lift is 120 yards deep; the new lift is 130 yards deep, on a 22° south dip. The slope is 75 yards from the drift; the east and west gangways commence at the foot of the slope, and a tunnel is driven north 150 yards from the slope to the small vein, with an east and west gangway opened thereon. The tunnel is 22 yards long, which is the distance between the two veins. The breasts are 10 yards wide and 80 yards long, formed in two flats. The formation of the stratas here is irregular and much confused; the pillars are 6 yards thick; the coal is 10 feet thick in the Big vein; the west gangway is 500 yards in, and has 17 breasts working; the section area of the gangway is $11+7+7\frac{1}{2}=67\frac{1}{2}$ square feet; area of west gangway on the lower level is $10+6+7=56$ square feet, and 165 yards in, and 5 new breasts opened thereon. The Small vein is so named from the fact of its being only $5\frac{1}{2}$ feet thick. The breasts and pillars are of the same extent as in the Big vein. The east gangway on the old level is worked in 1,200 yards, and has a run of 400 yards more to the territorial boundary line. The mines are ventilated by a 15 horse power fan, 12 feet diameter, paddles $2+2\frac{1}{2}=6$ square feet, 6 paddles=36 square feet section; this is too small for effect.

Gangways, 5; the upper and lower west gangways 665 yards in; 22 breasts open; the east, middle and lower gangways 1,400 yards in; the east and west gangways on the Small vein some 600 yards in; in all 2,665 yards.

Engines.—The slope engines are two 50 horse power, 18 inches+4 feet cylinder; rods, 3 inches diameter; link motion; a $15\frac{1}{2}$ feet fly wheel, 6 arms, 5+9 inches rim=45 square inches section; 2 five feet pinions, 6 arms each; a shaft 8 inches+10 feet long, and one 12 inches+16 feet long; a 7 feet+10 feet drum, perpendicular to the axis of the slope; 4 spiders of 6 arms each, laid with 10 inch timber, the shaft of which is worked by 2 bevel wheels; the fan engine is a 15 horse, 12 feet diameter; paddles already described; the power pulley is 12 feet diameter; the fan is constructed as an upcast, on the Beadle plan; 8 boilers, 4 of which are new, 2 are patched and 2 are in use 14 years, these two should not be used long; the diameters are 34 inches+36 feet long=288 feet; 4 good safety valves; grate surface is=$24+4\frac{1}{2}=110$ square feet; a 60 horse pumping engine, 20 inches+5 feet cylinder; a 16 feet fly wheel, 8 arms, 5+9 inch rim; an 8 feet pinion wheel, 8 arms; a 22 inch spur wheel, 12 inch face, rods 4 inches diameter; a 4 horse donkey engine feeds the boilers; all these engines are stationed in one building and kept well; 1,270 feet of $1\frac{3}{8}$ inch wire rope, in use for 4 months.

Air Courses.—The slope is a downcast, and the mines are ventilated by a 15 horse fan. The air splits at the bottom of the slope, and passes in along the gangways, returning back through the headings in the pillars, and ventilates the breasts; it passes in by the tunnel and divides east and west; passes in by the gangway in the Small vein and returns by the headings through the breasts; there is an overcast 15 yards up the slope, of an area of 25 square feet, and comes east 15 yards, runs to the upcast shaft into the middle level, 130 yards up, and continues up to the fan outcast air shaft. The principle is good, but the fan is too small in its paddles.

Remarks.—John Brown, a miner, was killed by a fall of coal, July 2d, and James Mayer had a leg broken by a similar accident. I measured the

air in the lower west gangway, the section area of which being 56 square feet+100=5,600 square feet, the standard at 18,136 cubic feet per minute, 5,600 cubic feet of air passed in 85 seconds, and as 60″ : 18,136 : : 85″ : $4\frac{2}{3}$ times too slow, or 3,955 cubic feet in 60″. I found no gas in any body. The water is strongly impregnated with mineral salt, which is an indication of carburetted acid gas. The gear teeth of the machinery are very strong. The breaker is one of the largest in the United States, requiring 1,500,000 feet of lumber to construct it, at a cost of $16 00 per M=$24,000 in timber alone; the machinery cost $12 00, and the construction $; aggregate cost, $. The capacity of the breaker is 230 railroad cars per day, or 1,100 tons of prepared coal. It prepares the coal of the three collieries, all of which are operated by the same firm. The west gangway is nearly worked out, on the middle level, some 3,960 feet.

Recapitulation.—Slope, 250 yards deep, south dip 22°; 6 gangways, aggregate length, 11,955 feet; 4 engines=175 horse power; 8 boilers, total length=288 feet long; 1,270 feet of $1\frac{3}{8}$ inch wire rope; 125 men and boys employed; 65 wagons; 10 mules; 5,000 feet of T rail track, 25lbs.; the aggregate length of tracks belonging to slope No. 1 is 16,955 feet of T rail; number of visits, 1; distance traveled, 20 miles; temperature, outside, 80°; inside, 68° to 71°.

No. 33.—Otto Slope, No. 2.

Inspected July 27, 1869.

Description.—This slope is located on the same premises; owned and operated by the same firms. The slope is sunk 95 yards on the first lift and 145 yards on the new lift—in all, 240 yards deep; on a south dip, 31°. The slope has two tracks, one pump road, and a good traveling road. The west gangway on the lower level is 200 yards in; area, 11+6+9=$76\frac{1}{2}$ square feet; the east do. is 180 yards in. The breasts are 10 yards wide; the pillars six yards thick; the coal 10 feet thick. The west gangway is drove in 200 yards; of an area of 11+9+6=60 square feet. The east gangway is drove in 180 yards. There are nine breasts open, each nine yards wide; the pillars nine yards thick. The west gangway, on the middle level, is drove in 1,400 yards, to a fault; the east do. is run 700 yards, to the line of the track. There is some gas evolved in this part of the mines.

Engines.—Two 50 horse slope engines, 18 inches+6 feet cylinders; a drum, 12 feet diameter and 12 feet long; three spiders, eight arms each; a large 14 feet pinion wheel is placed in the centre of the drum, which is worked by a spur wheel on the fly wheel shaft, thus giving direct and reverse motions to the drum, without any apparent jarring of the machinery; 16 feet fly wheel, eight arms, rim 5×9=45 inches; section, 10 inches; shaft, 14 feet long; drum shaft, 10 inches+16 feet long; the drum laging is of timber, 10 inches thick; 1,604 feet of $1\frac{1}{2}$ inch new wire rope in use at the slope, and 126 feet $1\frac{1}{2}$ inch do. used at the breaker, to hoist the coal wagons to the platform; a 40 horse engine in use at the dirt plane, with 1,000 feet of $1\frac{1}{2}$ inch wire rope; a 15 horse engine running the fan; fly wheel, 16 feet diameter, and 60 feet of a 15 inch gum belt used. The fan paddles are 14 feet diameter, 4×4=16 square feet each=96 square feet area, and running at 115 revolutions per minute; a 30 inch fan pully and a gum belt 65 feet long by 14 inches; a 40 horse and a 30 horse engine are

used for hoisting in the white and red ash veins; a gum belt 16 inches by 240 feet long is used; four new boilers, 34 inches by 30 feet long; two safety-valves; grate area, $4\frac{1}{2}\times12=54$ square feet; a 250 horse Bull engine, used for pumping purposes, (a Cornish built,) 40 inch+7 feet stroke; eight boilers attached, 36 inches by 36 feet long; the pump columns are, one 14 inches and one 12 inches; area of grate surface, $4\frac{1}{2}\times16=72$ square feet; four boilers, 34 inches by 30 inches, for the breaker, all of which are considered good; the water is also good, and proper care given to the engines and machinery; number of engines, 8; horse power, 515, with 16 boilers; total length, 576 feet long.

Recapitulation.—Slope two lifts, 240 yards deep; eight engines, 515 horse power; 16 boilers, 576 feet long; 149 men and boys employed; 2 mules and 33 wagons in use; four gangways, aggregate length of same 7,440 feet; 2,724 feet wire ropes in use; about 600 feet of gum beltings used; 15,000 feet of tracks laid outside; 2,400 feet of siding track, for railroad cars, of 68lb rail; 7,800 feet of 25lb track laid inside; the aggregate length of tracks at this colliery is=24,844 feet=$4\frac{3}{4}$ miles; distance to and back, 16 miles; traveled in and out of the mines, five miles=21 miles; temperature 80° outside, 68° to 80° inside; number of visits, 1; killed and injured, none.

No. 34.—Otto, No. 3, Red Ash.

Inspected July 28, 1869.

Description.—This colliery is owned and operated by the same firms that operate Otto Nos. 1 and 2. The slope is situate north of No. 2, some 400 yards; the coal from these three slopes comes to the same breaker, and is there prepared for shipment; a 40 horse engine is used at this slope. The slope has two tracks and pump road; 8 feet diameter drum, 8 feet high; 3 spiders 6 arms each, laged with 12 inch timber; 16 feet fly wheel, 8 arms, 5×9 inch rim; the shaftings are strong, and the machinery kept in good order; 6 boilers 34+36 feet long; grate surface, $4\frac{1}{2}\times16$ feet=72 square feet; the present west gangway that they are now robing back, is 7,920 feet in; 1,230 feet of $1\frac{1}{2}$ inch wire rope in use, and about 286 men and boys employed; not less than 50 head of mules and about 200 wagons; the shipping capacity of the three collieries when in full running, is equal to 260 railroad cars per day; each of these slopes is supplied with a Beadle steam fan, and after a careful examination of the mines, and inquiry made with the miners, I found no complaint amongst the men for want of air; there was found, however, a small indication of gas, but not in any sort of a body to become very dangerous, whilst such effective regulation is kept up amongst the officers in the mines. The ventilation was moderate, and the enlarging of the air courses was to be at once commenced. This done, it would obviate a more free access for the passage of the air, and a noticeable fact, that amongst a body of 560 employees, I have not a trace of complaint, for the season; and this fact alone, speaks well for this large colliery, and it affords me pleasure to state the good behavior and amicable conduct of the employees, and this is a matter of gratification to see the setting in a tide of good feeling amongst the working men and the sense of justice on the part of the employers; two elements which should never be at variance, as both interests are naturally and conjointly analagous to each other; the dissolution of these two interests carries with it a sweeping ruin.

No. 31.—Swatara Slope, No. 1.

Inspected July 29, 1869.

Description.—This I herewith submit a detailed description of the above colliery as herein set forth. This slope is located 9½ miles west of Pottsville, and 5½ miles south-west of Minersville, on the east bank of the Swatara creek, and about one-half mile south of famous Swatara falls. This colliery consists of a slope sunk 190 yards deep, on the south dip of the Big vein, at an angle of 45° dip. The estate is owned by ——— ———. Mr. Claud White is general superintendent, a gentleman well versed in the mining of coal and coal mines generally, and a resident member of the firm. The town of Tremont lies three miles south of these mines, and Pinegrove lies some eight miles south. The colliery is approached by a branch road of the Mine Hill railroad; it is now in contemplation to extend the new road from Lebanon and Pinegrove through to the mines, which would greatly enhance the value of the estates as giving a new outlet to Baltimore and Wilmington markets. Much of the surface coal has been worked, and when shafts are sunk to the basin, the deposit of coal must be immense.

Gangways.—The west gangway is drove in 990 yards to a rock fault, and the east ditto is drove in 1,000 yards; the distance from the slope to the tunnel is 42 yards, going to the seven foot vein in a northern course. The east gangway on this seven foot vein is drove in 900 yards inside the tunnel, and 200 yards from the slope, in all=1,100 yards; the air-hole is 596 yards inside the tunnel, and a pillar six yards thick supports the air-hole on each side; distance from mouth of the tunnel to the Black Heath vein is 47 yards, and 200 yards to the gangway mouth; the coal in the Black Heath vein is 6 feet thick, and dip 45°, and 45 yards from the Black Heath vein to the Red Ash vein, and a gangway of 90 yards drove on it; the east gangway is drove in 550 yards; the west ditto is drove in 1,400 yards; the breasts in these gangways are 10 yards wide and 54 yards long; the pillars are 6 yards thick, and each breast has 2 schutes, and the pillars are all cross-headed every 15 yards up; the area of these headings is 16 square feet; should be 36 square feet area.

Air.—I found no regular air-course in the lower gangways, but mainly depended on supply of air from the headings; I found the two levels broken down from No. 4 to No. 17 breasts; this crush was caused by reducing the pillars and driving the breasts up too near the counter gangways. The air passes down the mule road, and splits east and west in the gangway to supply all the lower level, and traverses back through the breasts to the fan upcast.

Remarks.—I advised Mr. White to engage three sets of good miners and open a new gangway through the crush, as it then evidently had settled, this done the coal could be recovered; I directed two additional doors to be erected on the east gangway of the Big White Ash vein, and make the air pass up the next breast, thence to a brattice up to the upper outcast, and a tunnel of 16 yards drove from the Big vein gangway to the 7 foot vein; as there is some gas found there, and there fix up a brattice to conduct it forward; I here measured the air and found it insufficient to air the little vein; I found the headings altogether too small, and directed their enlargement; I could not ascertain from Mr. Cox if any air holes were in this little vein, nor could he tell the distance to the fan; there should be a 12 yard pillar left to support the slope; I measured the air here again and found it took three minutes for 4,600 cubic feet of air to pass the index; the standard of air fixed at 18,136 cubic feet per minute, gives nearly 12 times too slow, or $11\frac{1273}{1813\,6}$ times; in consequence of this slowness of ven-

tilation, large bodies of powder smoke hang sluggishly in the mines and effectually sickens the men, and, also, this smoke is mixed with a portion of gas which vitiates the condition of the air and thereby makes it very obnoxious to inhale, and greatly influences the cause of sickness and bad health to the miners. I instructed Mr. Cox, the boss miner, to remedy this evil by erecting stop doors on the gangways, and open cross holes which would create a more rapid motion in the air and direct its course by fast batteries on to the fan outcast air shaft; to put two stop doors on the east gangway of the Big White Ash vein that would force the air into the upper level, thence by a brattice to the upper upcast, then tunnel from the big vein to the 7 foot vein, and then start 2 gangway airholes some 70 yards out to the stack; the air comes from the middle slope by a mule road; fix two doors between the tunnel and the slope turnout; the thermometer ranged from 50° to 68° inside, whilst outside it stood at 70°; the airhole is opened 60 yards west of the tunnel; all the breasts are shut off and batteries on, but not staunch; the air leaks through them.

Engines.—A 20 horse power fan ventilator 12 feet diameter, paddles 4 ×4=16 square feet×6=96 square feet area; 2 boilers 32 inches+25 feet long, running at 80lb on the beam; grate surface 30 square feet; 10 feet fly-wheel; 8 arms 4×6=24 square inches rim, used as a power pulley.

No. 36.—Swatara Falls Slope, No. 2.

Inspected July 30, 1869.

This slope is leased and operated by the same firm. The slope is sunk on the north dip of the Big vein, directly above the cascade, and is 150 feet deep; has two tracks and a pump and traveling road; area of section, 20+18+6=114 square feet; 320 feet of $1\frac{1}{4}$ inch wire rope in use in the slope; 3 boilers, 30 inches+20 feet; a 14 feet fly wheel, 6 arms, rim, 6+8 inches=48 square feet; a 5 feet diameter drum, 8 feet long; 4 spiders, 8 arms, each laid with 6 inch timber; 9 inch shaft, 12 feet long, and a fly wheel ditto, 9 inches+6 feet long; 22 inch spur wheel on wheel shaft. The engine is an old one and much the worse of the wear, running at 70lbs. steam. The east gangway is 600 yards in; the west ditto, 90 yards. The Small vein is 5 feet thick, 124 feet deep; the west gangway is in 400 yards and the east ditto is in 60 yards; 50 yards of a tunnel running west from the slope to the Little vein. The firm of Cain, Hacker & Cook worked out the coal of the Big vein under the old slope; there are 64 yards to the bottom; the heading on the east was of no account, it being too small to pass a boy through; the temperature in this slope stood at 46°, 54 yards to the fan on the east gangway; breasts, 10 yards wide; the pillars 6 ditto thick; there are 11 breasts working; one air hole; there is an air course in the first breast; dip 25°, and 100 yards gangway thereon, and has 200 yards more to run to the line; No. 1 drift is in 800 yards, and run out to the surface; the stack on the tunnel is 230 yards to the Little vein; No. 2 drift is in 600 yards; some 1,600 yards of a track is laid from the breaker to this slope, and the coal is first emptied into a schute at the cascade to avoid an inclined plane.

Remarks.—There are 3 slopes and 2 breakers on this colliery. There is still a prospect of large deposits of coal in the hills surrounding the colliery. The company uses an old gangway on the west side of the creek, midway between the falls and the new breaker, as a tunnel, and opened a drift on the western side of the mountain.

No. 37.—Swatara Slope, No. 3.

July 31, 1869.

No. 38.—Newtown Slope.

Inspected July 30, 1869.

Description.—The land is owned by Helfenstine & Zerenoltz, and leased and operated by Koll & Zerenoltz. John M'Donald is boss miner. This colliery consists of a slope sank 100 yards deep, on the north dip of Skidmore vein, dipping from 78° to 80°. The vein is 7 feet thick. It is situated 8 miles west of Pottsville, 3 miles east of Tremont and ½ mile from Swatara mines. It is approached by the same railroad branch, and ships by the Mine Hill railroad. To fully develop these mines it is first necessary to tunnel or shaft it; the present firm is not now in a condition to do either. The slope is 100 yards deep, using a cage on a 6 feet track. The east gangway is in 150 yards; the west ditto 160, in all, 310 yards; the east upper gangway is in 75 yards; the west ditto is in 1,400 yards, and only one breast working thereon; total length of the 4 gangways, 1,785 yards.

Engines.—One 60 horse hoisting engine, 18 inches+4½ feet cylinder, rods, 3 inches diameter; 16 feet fly wheel, 6 arms, rim, 6+8=48 inches; 8 inch+9 feet shaft; 7 feet pinion, 6 arms; 14 inch fan; 9 feet drum, 12 feet long; 4 spiders, 8 arms each, 10 inch timber lagging; 12 inch+16 feet drum shaft; 700 feet of 1¾ inch wire rope in use; 1 pole pump in use, and a feed pump extended 88 feet from the slope; a cistern stands in the engine house, containing 1,000 cubic feet of water; 4 boilers, 34 inches+30 feet long, for use of the slope, which runs at 100lbs. on the valve; this I reduced to 75lbs.; grate surface, 50 square feet; a 20 horse breaker engine, 12 feet wheel, 8 arms, rim, 5+7 inches=35 square inches; a 6 feet pulley on the wheel shaft; the cone gearing is now dispensed with; 2 boilers, 30+28½ feet long, grate surface, 5+6=30 square feet; a 15 inch belt, 50 feet long.

44 men and boys employed; no mules used to date; 14 wagons; 2 engines, 80 horse power; 6 boilers, 177 feet long; 700 feet wire ropes; 3 feet outside track laid, 25lb. rail; John Starr, Mr. Burns and Peter Rhodes, engine-men. The boss is opening an air hole each side of the slope to ventilate at present, but intends substituting a fan hereafter. There is no gas of any sort yet, and there is little fear of any danger to the miners for some time to come; area of slope, 96 square feet.

No. 39.—Beatty Shaft.

Inspected August 3, 1869.

Description—I herewith submit a detailed description of the above named colliery, as herein set forth. This colliery is located on lands owned by Girard heirs; leased and operated by Mr. James B. Beatty, of Pottsville. It is situated on the northern slope of the Mahanoy mountain, on the line of the Mahanoy and Broad Mountain railroad, some five miles east of Ashland, and seven miles west of Mahanoy City, and 35 miles north of Potts-

ville, by rail, and one mile west of the new planes. The coal can be shipped from this colliery by any of the railroads in this region; the coal being of a superior quality, and the veins generally good. Mr. Beatty is a practical operator, and under his directions the colliery will no doubt be a remunerative institution. The shaft is 124 feet deep, having a north and south dip. The shaft is strongly constructed, and, by all appearances, is a permanent concern. The east gangway is driven in 600 yards; the west do. 666 yards. The dip of the vein is 71°. The south dip is now finished. There is a tunnel drove to the Little vein, just inside the first turnout; the east gangway of which is in 200 yards, and in fault; the west gangway is in 175 yards, to a fault; area of the gangways average $10+7\frac{1}{2}+7=$ 61 square feet. The south dip of the Big vein is 527 feet from the north dip at this point, and 53 feet to the Seven-foot vein, and 173 feet from the top to the mouth of the tunnel. I asked a transcript map of the old works, as the company is robing back the works from the Hunter tract.

Ventilation.—The shaft is a down cast. The steam fan is located about 100 yards east of the slope, by the saw-mill, the engine of which runs the fan. The upcast air shaft is formed in an old broken-in breast, and a box-air course conducting the air to the fan on the surface. This box is covered in with saw dust. This contrivance is subjected to too many derangements, from its unprotected condition; it leaks much air, or, "vice versa," sucks air, which destroys the effective force of the air in the mines. The air is brought through the gangways, and passes up into an air-hole, thence through the headings through the breast, and returns to upcast.

Engines.—One 20 horse saw-mill engine. This engine is also used to run the fan. Two boilers, 30 inches by 20 feet long; a 14 feet pully, eight arms, 18 inch rim, driving a gum belt. The fan is 70 feet from the saw-mill and 96 yards from the outcast air shaft at the surface. A 60 horse breaker engine, 18 inches by 6 feet cylinder. This engine works the shaft and also the breaker. It has a 20 feet fly wheel, eight arms, rim $5\times10=$ 50 square inches section, and laged 24 inches broad with three inch plank, and used as a pully for a gum belt to run the breaker; 10 inch shaft, nine feet long; 400 feet wire rope, $1\frac{1}{2}$ inch; six boilers, 30 inches+20 feet long =120 feet; 90lb maximum pressure.

Remarks.—The air-hole in the gangway of the Big vein, on the east side, is in No. 11 breast, and a regular manway through these headings. John Burns got killed here, on the 25th of last March, by being crushed between the wagons. I directed a door to be placed at the fourth breast, on the gangway, to force the air into the face of that gangway. These breasts run up 30 yards. I found some powder smoke floating in this part of the mines, and the men complain of this evil, which must at once be remedied. The west gangway is in 666 yards, and has 170 yards to run to the line; the east do. is in 600 yards, and has a run of 1,700 yards to the boundary line. Both these gangways are still only water level gangways, and an escape gangway runs from the shaft bottom out to the surface, which does the drainage of the colliery and a traveling road for the miners. I disapprove of the location of the fan, and advised its removal to the upcast in the breast, as it would shorten the column of air and prevent any leakage. The box on the surface is 500 feet from the fan to the upcast shaft. I pointed out the utility of erecting the fan in the upcast shaft, and lay the steam pipe in the box, which would be much more prudent than to bring the air from the upcast shaft the distance of 500 feet to where it now enters the fan, and causes so much leakage. The fan loses 20 per cent. of its effective power from the open manner in which it is constructed. The air-course in the west gangway in the Skidmore vein is 36 square feet and is

in 140 yards. There are 68 yards of a rock tunnel, from the north dip of the Big vein to the Skidmore vein, on the upper level. The old top level on the Big vein west is 1,200 yards in and 40 yards to the drift mouth. There are 300 yards of a 25lb rail laid outside. The box outcast is only one-third the area of the upcast shaft; and this is conclusive evidence the fan cannot execute the work intended for it to perform. Six gangways, 3,441 yards, and 68 do. of a tunnel; the aggregate length of track laid, 3,809 yards=11,427 feet.

Recapitulation.—One shaft 124 feet deep of two tracks; 6 gangways 3,441 yards long, 1,700 yards to run to the eastern boundary line; 2 engines, combined power 80 horse; 8 boilers=160 feet long; 400 feet 1½ inch wire rope; 172 men and boys employed; 20 head of mules and 60 wagons. Killed, James Burns, a single man; injured fatally, none; 1,000 yards of flat bar iron track laid at the breaker, and the south dip west gangway is in 900 yards; the aggregate length of tracks of all sorts is equal to 5,709 yards=16,023 feet, or 3 miles; number of vists one 2=71 miles; distance by pike road and back, 36, in and about the mines, 6 miles=42 miles; temperature outside, 91°, inside, 54°. George Troutman, boss miner; John Johnson, engine-man; John Klease, outside manager. 13,323 tracks, 44 inches gauge, flat, 25lb., 99 tons, 2½ miles; capacity, 100 cars; ships 80 cars per day; 12 breasts; 186 feet, 30 feet, 21 feet pillars; 2 visits, 71 miles.

No. 40.—Hunter Colliery, No. 4.

Inspected August 4, 1869.

Description.—This colliery is located in the Mahanoy valley, on the north side of the Mahanoy mountain, on the estate of the late Stephen Girard, of Philadelphia, and now owned by H. D. Moore & Co., leased and operated by H. A. Moody & Co.; it is situated on the north side of the Mahanoy railroad, at Girardville, 4 miles east of Ashland and 17 miles by road from Pottsville in a northern direction. This colliery consists of drifts drove south to the Big vein some 90 feet above the water level, and is in full operation for the last ten years; it was formerly operated by the Preston coal company, and by them named colliery No. 4; one drift on the big vein which is capable, under ordinary care, to supply 75 railroad cars per day; the vein dips 70° north.

Gangways.—The gangways are 1,900 yards in, with 12 yard wide breasts and 8 yards thick pillars, each breast having two schutes, and still has a run of 150 yards to the boundary line; each breast is 66 yards long, and the coal 12 feet thick; west gangway is 300 yards in, and a rock tunnel 337 yards long into the Big vein; area of the gangway is 71 square feet.

Ventilation.—This is mainly effected by a 7 horse power steam fan; the tunnel is used for an intake air-course and the outcast air-course is 89 yards up to the surface, of an area of 16 square feet; this is an inlet to the face of the long gangway; there is a door at 89, and 7 yards of a piller left each side of the airhole for its permanent support; the air traverses the gangways and passes up into the headings and returns back through the breasts, thence to the upcast airshaft and out at the fan.

Engines.—One 50 horse breaker engine, 16 inches+4 feet cylinder; a 10 feet belt pulley, 22 inches face; shaft 12 inches+12 feet, rods 4 inches in diameter; 3 boilers 34 inches+25 feet long; one safety valve; these boilers

are repaired and one-half their length is new; runs 4 screens, one 5 feet+24 feet long; 2 ditto 5 feet+20 feet long; 4 ditto 4+8 feet long; there is 600 feet of gum belting used to run the breaker machinery.

Remarks.—I directed that double doors should be placed on the gangway to force the air through the works, as there is some large opening idle and forms much interference with the proper course of ventilation; there is no gas at present in these mines, but some powder smoke and a little black damp; both the fan and breaker engines are in good condition; the boilers are considered safe under ordinary care; the steam not above 65lb. I found the mines in good condition, the miners making no complaint; things generally wore a satisfactory appearance; the employer desiring to comply with the requirements of the new law in all its parts.

Recapitulation.—One drift 1,900 yards long; 1 gangway 27 yards ditto; a tunnel 337 yards long; one 20 horse breaker engine; one 7 horse fan engine; 2 engines 27 horse power; 3 boilers 25 feet long; west gangway 300 yards long; aggregate length of 3 gangways, 2,227 yards=6,681 feet; 350 yards outside track laid; total length of track laid with 25lb rail=7,692 feet; 129 men and boys employed; 13 mules and 37 wagons in use. None killed or seriously injured this season; distance from Pottsville and back by rail 76 miles, in and about the mines $3\frac{1}{2}$ miles, total $79\frac{1}{2}$ miles; number of visits, 2; miles, 110; temperature outside, 78°, ditto inside, 52°; 2 drifts; 40 feet coal; dip 70°; 3 gangways, 7,692 feet; total track 8,742 feet, $1\frac{3}{4}$ miles=$9\frac{1}{7}$ tons T rails.

No. 41.—Lawrence Slope.

Inspected August 5, 1869.

Description.—I herewith submit a detailed description of the above named colliery as herein set forth. This colliery is located on the north slope of the Mahanoy mountain, immediately at the new planes, on the south side of the Mahanoy railroad, 6 miles east of Ashland, 6 miles west of Mahanoy City, and 36 miles by rail north of Pottsville, on land formerly owned by the late Stephen Girard, of Philadelphia, but now the estate of J. Gilbert & Co., of Philadelphia, now leased and operated by Jacob Lawrence and Michael Murphy, of Minersville. As the mines are but newly opened, and from present appearances, no doubt it will eventually become a very productive colliery, the location being very favorable to railroad accommodation. The Philadelphia and Reading railroad planes being so near these mines, it would be but fair to suppose the colliery would not suffer much for want of car accommodation, likewise the coal can be transported over the different railroads of the region to any market in the country. This colliery consists of a new slope sunk on the north dip of the Big vein, having two tracks and a pump road, area of which is $24\frac{1}{2}+20+8=178$ square feet, and 100 yards deep on a dip 56°, at the bottom of which the gangway turns off east and west in solid coal; very little timbers need be used in it.

Gangways.—The east gangway is 216 yards in; the west ditto is 230 yards in; the coal here is 40 feet thick; the breasts are 12 yards wide; the pillars 8 yards thick; the area of the gangways are 67 square feet; there are 4 breasts open in the mines now.

Ventilation.—The ventilation is effected by a steam fan, 15 horse power, 10 feet diameter; 8 paddles, $4\times4=16$ square feet; section area, 128 square feet; 14 feet wheel, 6 arms, rim $5\times7=35$ square inches section; two 30

inch pulleys and one 60 inch ditto; $3\frac{1}{2}$ inch shaft, 20 feet long, located 12 feet from the breaker boilers; the air-courses are but 16 square feet area, and must be enlarged to 30 square feet; there was a large body of powder smoke swaying through the mines, causing the men to complain of sick headaches and vomiting; I found no gas of any sort here; 98 yards of an air-hole upcast shaft going out to the surface; the slope is constituted a downcast inlet air-course; the air splits at the bottom and traverses both gangways, passing up into an air-course that connects with the upcast to the fan; this air-course is $6\times6=36$ square feet; there is a manway in the pillar seven yards up, then strikes off in a diagonal direction upwards; the manway commences 53 yards from the slope, leaving a very strong pillar to support it.

Engines.—A 30 horse breaker engine, 30 inches by $4\frac{1}{2}$ feet cylinder; 12 feet wheel, 8 arms, rim $4\times7=28$ square inches, laged for a pulley wheel; grate suface, $42\frac{1}{2}$ square feet; a saw mill attached, is run by this engine, the shaft of which is 18 feet long, mitre geared; belt pulley, 12 feet diameter, 8 arms, rim $4\times7=28$ inches; the saw pulley is 8 inches; 80 feet of gum belts in use; 1 pole pump, 16 inch bore and 7 feet stroke, in the slope; a 60 horse hoisting engine, 18 inches by 6 feet cylinder, rods $3\frac{1}{2}$ inches diameter; 15 feet wheel, 8 arms, rim $5\frac{1}{2}$ by 9 inches=50 inches; 10 inch shaft, 9 feet long; two 8 feet pinions, 8 arms each; 12 inch fan; 2 drums; horn drums for a flat chain; 3 shafts, each 10 inches diameter, by 16 feet long; 4 boilers, 36 inches by 35 feet long; 2 safety valves; grate surface, 66 square feet; a 15 horse fan engine already described; 3 boilers, 30 inches by 26 feet long, grate surface, $42\frac{1}{2}$ square feet as breaker boilers.

Remarks.—The slope house is located some 60 yards back of the slope, and elevated 50 feet above the level of the slope mouth, continued up on trestle work to the landing on a level with the breaker. *I desired that plank batteries be used in the schutes, as any other mode of closing in the air cannot be depended on.* The accumulation of powder smoke in the mines is to be at once destroyed. The slope is substantially built; all the engines, boilers and machinery are in good order, and preparations making as fast as possible to comply with the requirements of the new law, for the better regulation of ventilation of mines and the protection of the lives of the miners in this county.

Recapitulation.—Slope 117 yards deep from the landing; 2 gangways, 446 yards long; 12 breasts working; one 15 horse ventilator; one 30 horse breaker engine; one 60 horse slope and pumping engine; 3 engines, combined power, 105 horse; 7 boilers, 218 feet long; 500 feet of flat chain on drums; 51 men and boys employed; 5 mules and 30 wagons in use; daily shipments, 35 railroad cars; can ship 100 cars daily when in full operation; no persons killed or seriously injured for the season. The estimated first cost of the colliery is $96,000. Philip Mangold, mining boss; Michael Merkel, outside boss; Peter Walsh, engine-man. 20 per cent. smoke, &c.; 2 visits, 72 miles; gangway, length=1,338 feet; double length of slope, 702 feet—total=2,040 feet; 1,200 feet outside tracks=3,240 feet=$\frac{3}{4}$ miles =29 tons; 2 veins, 40 feet thick of coal; temperature, 78°; temperature nside, 52°.

No. 42.—Silver Brook Shaft.

Inspected August 6, 1869.

Description.—This colliery is located on the Silver Brook creek, on the extreme north-eastern limits of the county, adjoining the county of Carbon, on lands owned by Silver Brook coal company, leased and operated by Messrs. Hosea & Longstreet. The colliery consists of a shaft, sunk 140 feet deep, on the Skidmore. The colliery is located in Rush township, on a large flat of the Broad mountain, 6 miles north of Tamaqua, 5 ditto south of New Pottsville, in Carbon county, and 28 miles north-east of Pottsville. Owing to the flat table lands around the colliery, the mines are subjected to a large amount of water draining in. The colliery is approached by the Lehigh Valley and Mauch Chunk railroad. The Primrose vein is 200 yards from the tunnel, and is 8 feet thick; the breasts. are 9 yards wide; the pillars, 5 yards thick, and the breasts run up 50 yards. The top roof is a poor quality, and therefore dangerous to work The tunnel is 300 yards in. The coal in the Big vein is 30 feet thick. Mr Hosea is desirous to comply with any instructions given, for the bette ventilation, and the protection to the miner.

Gangways.—The east gangway on the Skidmore vein is in 510 yards; the west ditto is 100 yards, and in a fault; the area of these gangways=52 square feet; the east gangway on the Big vein, from the tunnel to the facer is 1,050 yards, and to the boundary line of the tract, is 2,470 yards; the 3. gangways are 1,660 yards long; there are a number of 26 breasts working. therein, and are now commenced robing out the long gangway.

Ventilation.—This is effected by air holes; the shaft is used for a down-cast; the air passes in the Skidmore gangway to the tunnel; drove to the Big vein; thence through the Big vein gangway. The air courses are too contracted to be effective. The pillars are holed from breast to breast. Still there is considerable powder smoke in the mines when the miners work. The inside air hole is 300 yards from the face of the east gangway on the Big vein, and communicates with the air from the Skidmore vein at the tunnel. The temperature here was 50°. I am happy to know there is a good escape traveling road for miners to escape by, independent of the shaft, and this is constantly kept in order.

Engines.—One 60 horse shaft engine, 18 inch+6 feet cylinder, rods 3 inches diameter; 15 feet wheel, 8 arms, rim $5\frac{1}{2}+8=44$ square inches; 5 feet drum, 12 feet long; 5 spiders, 8 arms, 8 inch timber lagging; 9 inch shaft, 10 feet long; one 20 horse saw-mill engine; 8 feet pulley wheel; 60 feet 10 inch gum belt; 5 boilers, 3 of which are 34 inches+34 feet long, and 2 ditto, 30 feet long+34 inches diameter; grate surface, 5+15=75 square feet; running maximum, 85lbs. of steam on valve; 690 feet of $1\frac{1}{4}$ inch wire rope used to hoist in the slope; 2 pinion wheels, each 7 feet diameter, 8 arms each, 12 inch face; drum shaft, 12 inches+16 feet; fly wheel shaft, 11 inches+8 feet; pinion shaft, 10 inches+6 feet; the bed plates, plumer blocks and rods, all in good condition; 6 boilers in 3 nests, 34 inches+31 feet; 3 good safety valves; grate surface, $4\frac{1}{2}+18$ feet=81 square feet; 26 breasts working; a 25 horse breaker engine—this engine receives its steam from the boilers of the shaft engine—and a 160 horse, double acting, steam pump used in the slope, cylinder 30 inches+7 feet stroke—this pump, too, receives its steam from the boilers of the shaft engine—also a 60 horse slope engine, which at present is idle, as that level is worked out; 4 boilers, 34 inches+30 feet each, not used.

Remarks.—Owing to the flat surface of the tract, there is much water dropping in the mines, and this causes a disturbance in the passage of the

air. We proposed a remedy for this evil, by pitch roofs. It is supposed the shaft is sunk on the Primrose vein. There is a large amount of powder smoke floating about at times in the gangways. This evil we proposed to remedy by placing stop doors on the gangways, and give an additional force to the air current by enlarging the headings, drive out an air hole and remove the temporary brattice. I think the present robing of the mines will eventuate in an injury to the mines, on the score of crushing in. The coal is 30 feet thick. The Skidmore and Big veins are worked in this colliery. Mr. Hosea promised to fulfill our general directions. The engines, boilers and machinery, and also the general appearance of the improvements, are in good condition.

Recapitulation.—3 working veins; the Big vein, 30 feet thick, gangway, 1,050 feet; Primrose vein, 6 feet thick, 100 yards; Skidmore vein, 8 feet thick, gangway 510 yards; the three veins=44 feet of coal; the 3 gangways are 1,660 yards=4,980 feet long; about 26 breasts working; slope 140 feet deep; the tunnel 381 feet long; the aggregate length of openings =5,501 feet; the distance from Pottsville and back is 54 miles; in and out of the mines, 5 miles=59 miles; killed, one—John M'Nulty, July 27, 1869, by reaching over the cage too far in throwing off his mining tools whilst the cage was in motion, was precipitated down the slope and killed. 690 feet of $1\frac{1}{4}$ inch wire rope in use; 5 engines, collective power, 325 horse; 17 boilers, 468 feet long; 110 men and boys employed; 11 mules and 30 wagons in use; none injured; temperature in the mines ranged from 46° to 50°; ditto, outside, 72°; course of the air was $4\frac{3}{4}$ times too slow; furnace ventilation only; a fan ventilation is in contemplation of erection. A good feeling exists between the employees and employers. Jas. Lyons, boss miner; Thomas Ogdenchuft, engineer; air, $11\frac{1}{3}$ times slow; no fan; furnace; 7,360 feet T rails= miles= tons; shipments, 40 cars per day.

No. 43.—Honey Brook Slopes Nos. 1, 2 and 3.

Inspected August 10 *and* 11, 1869.

Description.—I herewith submit a description of this colliery as herein set forth. This colliery consists of 4 slopes sunk on the estate of Honey Brook coal company, leased and operated by John B. M'Creary & Co.; they are situate at New Pottsville, at the boundary line of Schuylkill and Carbon counties, three of which slopes, Nos. 1, 2 and 3, are sunk within the limits of Schuylkill county, and are distant from Pottsville 30 miles in a north-eastern course, 12 miles north of Tamaqua, and 3 miles west of Hazleton; the Honey Brook mines are situated on the large flat or table land of the Broad mountain, almost a level, about 3 miles+2 in extent and approached by the Western and Erie railroad only; the coal is of the best quality, and in an exhaustless quantity, and whilst under the management of Mr. M'Creary, who, by the way, is a practical operator, cannot but become one of the largest producing collieries in the county or State; the force employed at this colliery is 650 men and boys; the place is laid out for a town, but the company reserves all the commercial rights within their power, and exclude any business within the district; the sale of any sort of liquors is positively prohibited except within their hotel, which is a privileged institution; the moral and religious deportment of the citizens is of the highest social order, which would put to blush the denizens of a metropolis. The No. 1 is sunk 80 yards deep, with two tracks; the pump is on the north

dip, with 2 columns, each 20 inches; the slope is sunk on the Big vein which is 30 feet thick; there is a dividing slate between it and what is termed the Henry Brook vein, of 18 inches thick, or as a twin of the Big vein, and some term the intruding vein the Warton vein, but the best mining authority say it is a splinter of the Big vein, as it invariably runs parallel with the Big vein throughout its whole length of that tract or territory; the partition slate is holed at intervals of 50 yards to admit the air to traverse the works freely; and the gangways on these veins are of a section area of 57½ square feet; the ventilation is fair.

No. 44.—No. 2 Slope.

Inspected August 11 *and* 12, 1869.

This slope is sunk on the north dip of the Big vein, has 2 tracks and a good traveling road; the west gangway is 1,900 yards in, and the Warton vein is 300 yards in; the breasts run up from 63 to 80 yards each; there is a tunnel from the north to the south gangways 70 yards long; the ventilation is conducted by furnace and stacks; the breasts are 10 yards wide; the pillars 6 yards thick and cross-headed every 15 to 20 yards up, with a cross-heading at the top of the breasts, running along their whole distance, which ventilates the breast tolerably well; slope is 300 feet deep, 186 square feet.

No. 45.—No. 3 Slope.

Inspected August 14, 1869.

This slope is sunk 90 yards under the bottom of slope No. 1; the aircourse is over this slope, and the Honey Brook or Warton vein gangway is used for an inlet to the south gangway on the Big vein, and a stop door at the 109th breast commands the course of the air here and drives it through the works. There are 100 breasts on the south dip gangway; there are 800 yards from slope No. 1 to No. 3, and No. 3 slope is still continued down 93 yards deep. There are scarcely any timbers used in these gangways, as the veins are so thick and the coal very strong. The east gangway is in 200 yards, and 13 breasts open on it; also the west ditto is in 200 yards, and 13 breasts open on it; the tunnel on the north dip, the east gangway of which is in 150 yards; the west ditto is in 175 yards, and 3 breasts open on each gangway; all the airholes comes out in slope No. 3, over No. 1 gangway, and strike into No. 47 breast; there are two wagons hoisted at a time in this slope; the dip of the vein is 48°; the Warton vein is eight feet thick.

Gangways.—No. 1 slope has two gangways. North gangway is 1,700 yards in, and has a run to the boundary line of 1,050 yards more. The gangway on the Warton vein is 900 yards in=2,600 yards long. The crossholes are every 30 yards apart, and 21 breasts working on them. The west gangway, on No. 2 slope, is 1,900 yards in, and the Warton gangway is 300 yards in=2,200 yards. The tunnel to south and north veins is 70 yards long. West gangway, on No. 3 slope, is 200 yards in; the east do. is 200 yards in=400 yards, and 26 breasts open on them, each 10 yards wide and 80 yards long. North dip, east gangway, is 150 yards, and west

do. 175 yards in=225 yards long, and six breasts open on them. There are six gangways radiating from the bottom of No. 3 slope, three east and three west, each in 30 feet thick of coal. The three slopes are 443 yards deep; one chain, 275 yards, of $\frac{3}{4}$ inch, and one rope, 275 yards, $1\frac{1}{4}$ inch, and one 366 yards $1\frac{1}{4}$ inch rope, and 300 yards of $\frac{7}{8}$ inch chain. The total length of all gangways=14 gangways=5,775 yards long; 54 working breasts=918 yards, and 285 breasts finished=4,857 yards; to this add 2,230 yards of counter gangways; the aggregate length is=five miles, nearly=440 breasts worked. This is an immense amount of coal shipped.

Ventilation.—The slopes are all downcast, and the air courses from all of them connect at slope No. 3. There is a furnace erected each side of No. 3 slope, and comes over No. 1 gangways, and strikes into the 47th breast. There are two air-holes on the west side of the 49th breast, both 233 yards long. The furnaces come out at the surface. The ventilation of these mines cannot be thoroughly effected by furnaces, and a considerable amount of powder smoke exists in part of the mines.

Engines.—Slope No. 3 has two 50 horse engines, 16 inches+3 feet cylinders; rods, three inches diameter; one 10 feet+12 feet long; three spiders; eight arms; nine inch laging; shaft, 12 inches+9 feet; a 15 feet pinion wheel on the end of the drum, as a power pinion, 10 inches+12 feet shaft; all the machinery very strong; a link motion; six boilers, 34 inches+30 feet long; all good; grate surface, 5×18=90 square feet.

Slope No. 2 has 160 horse power engine, $38\frac{1}{2}$ inches+7 feet cylinder, and one 200 horse, 44 inches+10 feet cylinder; 12 boilers, in four nests, each 34×30 feet=360 feet; four safety valves, carrying 85lb steam; four new, 1 patched and the rest in ordinary condition; a 15 feet fly wheel, 8 arms, rim 6+8 inches=48 square inches section; one 60 horse hoisting engine, 18 inch+5 feet cylinder, and one 30 horse breaker engine, 9 inch+$2\frac{1}{2}$ cylinder; 12 feet wheel, 8 arms, rim 9 inches+12 inches=108 square inches section; shaft 9+12 feet; a pump for washing coal, 9 inch+8 feet cylinder, attached to hoisting engine; 1 inch chain, 180 yards long; No. 1 breaker engine is a 20 horse, and one hoisting engine 60 horse, 18 inch+6 feet cylinder; a 20 feet fly wheel, 8 arms, 6+8 rim=48 inches section, rods $3\frac{1}{2}$ inches diameter; shaft 10 inches+12 feet long; 6 boilers 30 inches +34 feet=204 feet, in 3 nests; 3 safety valves; also one 50 horse, 16 inch +4 feet cylinder; 2 chains 180 yards long each; at No. 2 shaft, 4 boilers 34 inches+32 feet long; 2 safety valves; grate surface $4\frac{1}{2}$+12=54 square feet, and a 30 horse engine at Audenried; in all 10 engines; collective force, 710 horse power; 30 boilers; total length, 932 feet; 660 yards chains.

Remarks.—Having inspected these mines and machinery, I found them in excellent condition. Although the ventilation is not as good as should be, yet it is considerable; nothing but fan ventilation will accomplish the desired effect. I advised Mr. Hopkins to adopt it as soon as possible, as more and safer work can be accomplished, and less danger incurred, under its influence, which will result to the interest of the employer as well the employed, and the company will find it much cheaper and economical than any other system. There are persons who are impressed with the idea that a furnace can ventilate sufficiently for deep mining purposes, but this idea is exploded, and ridiculed by every practical miner and mining engineer. The purchase of the new tract by Mr. M'Creary & Co., adds greatly to the interest of the Honey Brook mines, opening to them a much larger coal field. I found the air split in the Big vein gangway, and some of it forced into the Honey Brook or Warton gangway, airing that work and returning through and coursing up to the surface. I found a dog-hole

from the slope to the fan of the Big vein gangway, and here there is a check door and a furnace and a new air-hole 600 yards ahead and working at the face, and cross-holes every 30 yards. There are 3 principal air-holes on this gangway. I directed that a cross-hole be cut into the Warton vein and it for an inlet air-course to the south gangway; on the Big vein erect a door at the 109th breast, and force the air into these works; let the 101st breast on the counter gangway be used as an air-hole, and thence to the surface, some 50 yards. Owing to the slow draft made by the furnaces, the powder smoke and vitiated air cannot be abruptly removed, and thus becomes deleterious to the general health of the miners. I advised the boss miner, Mr. Evans, to ventilate this part of the mines, by making the Warton gangway an up-cast, and the Big vein gangway the inlet air-course, as there is but 18 inches thick of a partition slate between them, and place double check doors on these gangways to command and direct the course of the air; at the foot of No. 3 slope, where the 6 gangways start, the air should be brought through by heading the gangway pillars, and erect doors thereon. There is a common furnace erected each side of the slope, each coming out at the surface, but owing to the large field the air has to traverse, and gathering with it the noxious elements in the air, it becomes loaded with carbonic acid gas, and acts on the volume, and at many places prevents a perfect circulation. Furnaces merely draw from the nearest source, whilst the greatest volume of air should be conducted to the most distant parts of the mine and returning through the works to the outlet up-cast: and the steam fan ventilator is the only device that can accomplish this object properly.

Recapitulation.—The Honey Brook colliery consists of 4 slopes, No. 1, 80 yards deep, No. 2, 90 yards ditto, No. 3, two lifts, one of 90 yards and one of 93 yards; aggregate depth, 450 yards; 14 gangways=5,775 yards long; 54 working breasts; the counters run 2,230 yards; total length=5 miles; 10 engines, their collective power=710 horse; 30 boilers=932 feet long; some 3,500 yards track laid outside; aggregate length of track laid in and out of mines=7 miles of 28lb, 308 tons of T rail; 650 men and boys employed; 31 mules and 120 wagons; none killed; 1 seriously injured at the colliery; no steam fan in use; the water is good; 660 yards of $\frac{7}{8}$ inch chain; 400 yards $1\frac{1}{4}$ inch wire rope in use; Richard Hopkins, agent; George Evans, boss miner; daily shipments, 260 cars per day.

No. 46.—Heckscherville Deep Slope.

Inspected August 17, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. This colliery is located on the Heckscher estate, in Glen Carbon valley, on the north slope of the Mine Hill, approached by the extension of the Ashland and Mine Hill railroad. The colliery is named the Manhattan Slope, and owned by the Manhattan coal company, leased and operated by John Wadlinger; A. B. DeSalle, agent. It is eight miles north-west from Pottsville, three miles north of Minersville, on the south slope of the Broad mountain; the slope is 24+20+8 feet section area, and 180 yards deep; south dip 55°; the west side is 80 yards deep; 700 yards of $1\frac{3}{8}$ inch wire rope in use; it is sunk on the Crosby vein; the coal is 14 feet thick; the west gangway is drove 400 yards, to a fault; the east about 1,360 yards; no gas can be found in the vein. The old counter gangway

is used as a water course, and is communicated with the shaft at Heckscherville, and the water pumped out by the Bull engine; 45 yards of a tunnel, reaches from the Crosby to the new vein, the coal of which runs from 6 to 12 feet thick, with a partition slate of 1 inch to 60 inches between it. The east gangway on the new vein is 200 yards in, and the west ditto is 100 yards in=300 yards. The schutes are 10 yards from the gangway and the section area of the headings=20 square feet; these gangways have yet a mile to run to the line; the area of these gangways is $10+5\frac{1}{2}+7$ feet=$53\frac{1}{4}$ square feet section. The east gangway is 20 yards ahead of the air-course. At present the fan is not erected; the furnace ventilation is the only mode in use. There is a furnace working on the east side of the slope, and, owing to the slow draft, the ventilation is poor, and the air being contaminated with noxious airs, which cannot be removed sufficiently, the gas created by the fire mingling with the other gases, rendering the air unhealthy to breathe. James Keating was killed by injuries received by the explosion of fire damp, leaving a wife and three children to mourn his loss. His breast was No. 8, and it was worked up 85 yards and 9 yards in width. He was opening a heading for ventilating. After inquiring of Thomas O'Neil, the fire boss, the condition of the situation, he was answered that all was right, whereupon, as he entered the place, the gas exploded and received such injuries that he died shortly after. There is 15 yards of a chain pillar between the face of the breasts and the counter gangway. A tunnel drove northward cuts the Crosby vein, cuts the Zeller and the Daniel veins. The Zeller vein is 15 yards north of the Crosby, and the Daniel vein is 65 yards north of the Zeller vein. The coal in the Daniel vein is 18 feet thick. The east gangway is in 800 yards to a fault; the west is in 1,600 yards and ends at the boundary line=2,400 yards. Only one breast on the west side that has the benefit of any air. I demanded to be furnished a transcript map of the old works of the Daniel vein. The east gangway on the top level of the Crosby vein runs to Wm. Payne's old slope, over 1,800 yards; the west ditto runs 700 to a fault. The east and west gangway on the middle level of the Daniel vein runs a mile each way. The Skidmore vein is 25 yards north of the Daniel vein, so the tunnel from the Crosby to the Skidmore veins is 105 yards, and continued still further to the Jugular vein, 75 yards north, this making the tunnel 177 yards long =531 feet. The thickness of coal in the 5 veins is=50 feet thick; e. g., Crosby, 14 feet thick; the Zeller, 4 feet ditto; the Daniel, 18 feet ditto; the Skidmore, 6 feet ditto; the Jugular vein, 8 feet thick=total, 50 feet; east gangway on the Jugular vein is 1,860 yards in, and the west ditto is 800 yards in=2,660 yards. The water of the old level is dammed in at this tunnel, which prevents the surface water and the water in the old levels from percolating through to the lower levels. The breastwork of the dam is formed of a 5 feet wall, made of dressed stone and brick laid in cement; the wall is $13+8$ feet=104 square feet arched inward; the breasts are 75 yards long on a 48° dip, and the coal was 80 feet thick; the gangways are 2,520 yards long; by an approximate estimation it contains 635 millions of gallons of water, and this vast body of water is 90 yards above the miners in the lower level. This vast body of water is confined in the upper part of, and subject to accidents arising from shocks by explosions or decay from the water being so strongly impregnated with mineral salt alumina. The pillars are more to be dreaded to break in than the mason work.

Gangways.—Crosby vein, the west gangway, is in 400 yards, and in fault; the east do. is in 1,360 yards. This vein is free from gas. The counter gangway east is in 1,300 yards. Total gangways on this vein are 2,700 yards; length of tunnel is 177 yards. New vein, east gangway, is

200 yards; west do. is 100=300 yards. Daniel vein, west gangway, is in 800 yards; the east do., 1,600 yards=2,400 yards. The top level of the Crosby vein, east gangway, is in 1,750 yards; the east do., 700 yards=2,450 yards. Skidmore vein gangways, each 100 yards=200 yards. Jugular vein, east gangway, is in 1,860 yards; the west do. is in 800 yards=2,660 yards. Zeller vein gangways are dammed up, and are 2,520 yards long. New vein counter level, east gangway, is 800 yards; the west do., 600 yards=1,400 yards. The aggregate length of all the 14 gangways is 44,990 yards; tunnel, 177 yards; total length, 15,167 yards=8¼ miles. The whole gangway openings on this mine will exceed 10 miles. Estimating breasts and pillars at 16 yards in breadth, making due allowances for interferences, will average 900 breasts.

Ventilation—The mines are ventilated by furnaces and small grates. I condemned the small grates *in toto*, as being unfit and unsafe; and likewise the gas created by them mingling with the air, made it unhealthy for the miners. I found a large body of powder smoke in both gangways of the new vein, and gave instructions how to remedy this evil. The headings are 20 square feet section. I directed that an air-hole be made at the face of the gangway, and that air to connect at the tunnel, and pass in by these gangways to their face, thence up into the breasts, and come back through the headings in the pillars to the outlet upcast, carrying with it in its coursey an noxious gas or foul air that may evolve in that part of the mines. I directed that a manway be made inside the schute. The schute to be eight yards thick, and drive an air-hole to the old level, and connect it with the upcast, and to use the fourth breast for it, and head all the pillars to the face of the gangway, to carry Jugular manways with canvasses on the draw holes, to keep the air in its proper course. I condemned some safety-lamps, and directed more particular attention given to them, etc. To air the Jugular vein, the air-course should be over the gangway, of an area of 14 square feet, and connect with the cross-holes and manways. This would ventilate properly. There are two air-holes in the east gangway, but the current has little force. A common furnace is erected on the east side of the slope. All in all, the ventilation is poor. Per cent. 20 of gas evolved.

Engines.—Two 30 horse slope engines, 14 inches+3½ feet cylinder; two upright drums, moved by level wheels, seven feet diameter each; three shafts, a 10 inches by 10 feet, one 10 inches by six feet, and one 10 inches by 10 feet; two five feet pulleys, eight arms, rims 3 by 12 inches face; a 3 horse donkey pump, to supply the boilers; five boilers, in two nests—three of 30+24 feet and two do. 30 inches+30 feet long; grate surface, 5×16=80 square feet; one steam gauge; one 30 horse breaker engine, four boilers, 30 inches+30 feet long; one 500 horse pumping engine, at Heckscherville, eight boilers, 30+30 feet long; all these boilers are inspected occasionally; four boilers at the slope, 30+30 feet; five engines, 593 horse power, 23 boilers, 660 feet long; all of which are in a good condition and in good care.

Remarks.—I have inspected these mines and machinery, and find the mines in many parts of the works poorly ventilated, not sufficient to remove or dilute the powder smoke, and found considerable gas in some of the works. I condemned most of the safety-lamps that were used by the miners, and directed that they should be cleaned and locked, and new gauzes furnished them, and a strict rule established for the protection of the miners. I advised the tapping of the water-dam in the upper works, so as to gradually to remove it without endangering the miners. I investigated the cause of James Keating's death, and also examined the situation, and am prepared to agree with the verdict of the jury on the point: That Thomas O'Neil, the fire boss, did not do his full duty, and thereby h

lost his life. I took down the statements of the witnesses, and they are now on file in my office. Mr. Keating got burned at the same time by gas.

Recapitulation.—The colliery is located 8 miles from Pottsville, number of miles; 2 visits=24; traveled in the mines, 5 miles=29 miles; number of gangways, 14; length of gangways, $8\frac{1}{4}$ miles; number of old breasts, 870; number of new breasts, 30; depth of slope, 180 yards; number of engines, 5; horse power, 593; number of boilers, 23; length of boilers, 660 feet; 150 men and boys employed; 20 mules and 60 wagons in use; 700 yards $1\frac{3}{8}$ inch wire rope in slope; one person killed; one person injured by gas; distance traveled, 29 miles. Officers, A. B. DeSalle, superintendent; John Morrissy, boss miner; John Lucas, first engineer; Thomas Farrell, second engineer; traveling roads out of the mines, three; air, $9\frac{1}{2}$ slow; 12 years in operation; temperature out, 83°; ditto in, 52°; difference, 31°; 1,460 feet outside track, 44 inch gauge; 25lb rail.

No. 47.—Mount Pleasant Slope.

Inspected August 19, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. The colliery is located on the lands owned by York and Schuylkill coal company, at the western extremity of Glen Carbon, on the south side of the valley, some ten miles north-west of Pottsville, and approached by the Ashland and Mine Hill railroad; the colliery is operated by H. A. Schullenburger; the slope is sunk on the north dip of the Daniel vein, at an angle of 51° section area, being 22+20+9 feet=189 square feet, and 780 feet deep; the roof is a little faulty, which may, if not attended to, result seriously; the slope is supported on each side by a 35 feet thick pillar. The first breast on the west side is made a traveling road, and also a pump road, and a pillar 28 feet thick left between this pump road and the upcast shaft; the timbers are generally too slight. The breasts are worked by one schute; the air-course should be carried over, and with the gangway 6 feet above the collar, and headed into the breasts of an area not less than 36 square feet; a tunnel from the slope to the Church vein, 45 yards long; the west gangway on the second level is in 1,800 yards, and has to go 130 yards more; there are 110 breasts on this gangway, 4 of which are new; the counter gangway is at 70th breast, and is in 300 yards, 4 breasts working on it; the Big Daniel tunnel is 40 yards east of the slope, and into the Daniel vein 85 yards; the west gangway in this vein is 1,100 yards in; the east ditto, 500 yards; there are three veins working in this colliery; the coal is 36 feet thick.

Gangways.—Area of these gangways average 64 square feet; the breasts ditto, 7 to 8 yards wide, and run up 80 yards; the coal 14 feet thick; the west gangway on the second level of the Daniel vein is 1,800 yards in, with 110 breasts on it; the counter ditto is 300 yards in; the lower level west gangway is 1,100 yards in; the east ditto, 500 yards in=1,600 yards; from the old slope to the tunnel mouth in the Church vein, is 330 yards; to the Danial vein is 60 yards; to the new slope, 40 yards; to the Church vein tunnel 45 yards; and 300 yards east of this is closed; two veins have four gangways, 3,700 yards long, about 22 breasts working; the whole length of inside track=12,525 feet.

Ventilation.—The mode of ventilation used, is a common furnace; the upcast shaft is a 6+8+6=42 square feet area; it is proposed to erect a

steam fan thereon; it goes into the top level, thence out to the surface; there are two airholes on the east gangway on the Daniel vein, and communicate over the slope by a brattice, and a breast is left open in each gangway for that purpose; the air is brought into the Church vein by the tunnel, and airs that work; there are three airholes on the west gangway to ventilate that part of the mines, of an area of $10+5\frac{1}{2}+7\frac{1}{2}=58$ square feet, and dip at 50°; the air is poor and the ventilation slow; there is much powder smoke amongst it, which makes it unhealthy; speed of air, 9 times slow.

Engines.—A 50 horse engine at the old slope, 16 inches by 14 feet cylinder; 6 boilers in 2 nests, four of which is 30+36 feet long, and two 36+21 feet long=186 feet; 2 safety valves, rods 3 inches in diameter; drum 8 feet by 12 feet; 4 spiders, 8 arms; 7 inch timber laging; pinions 8 feet diameter, 8 arms, 12 inch face; 24 inch spur wheel; a 16 feet wheel, 8 arms, 5×8 rim=40 square inches section; drum shaft, 9 inches by 16 feet; wheel ditto, 8 inches by 10 feet; a water tank containing 30,000 gallons, erected at the slope; a 30 horse breaker engine; 3 boilers, 30 inches by 20 feet=60 feet; 12 inch by 36 inch cylinder; 17 feet wheel, 6 arms, rim $4+5\frac{1}{2}$ feet, $22\frac{1}{2}$ square inches section; $12\frac{3}{4}$ inch shaft+9 feet long; 8 feet pulley, 8 arms, $2\frac{1}{2}+20$ inch face; 120 feet gum belt and 89 feet long; steam at 65lb; no person nearer than 30 feet of the boilers; a 30 horse dirt plane engine; 7 feet drum, 12 feet long; 4 spiders, 8 arms each, 7 feet pinion, 12 inches face; 50lb steam used; 2 boilers 30+20=40 feet; 2 safety valves; the boilers are good; a 50 horse north slope engine; 4 boilers, 34 inches by 31 feet=124 feet; the number of engines are four; collective power=160 horse; 15 boilers=440 feet long; all of which are in a good condition; the water is found to be good; the area of grate surface equal to the power needed.

Remarks.—The slope is just new, and is sunk 180 yards deep. The roof in some parts is not quite safe, but it is to be made so. Dip of the veins=50°. I found a good traveling road on No. 1 breast, on the west side; the pump is also located in it. The upcast shaft is drove 28 feet west, and parallel to this road, which runs in to the top level. The timbers used are not strong enough to be durable. The tracks are laid with a 25lb rail and a 44 inch gauge. The air should be carried over the gangway, near the top slate, of an area of 36 square feet, and six feet above the collars. This would be the best method to ventilate, as it could be headed into each breast at will, and thoroughly ventilate any of them as desired, whilst the others could be closed, and the course of the air would not at all be deranged. Each breast has but one schute. The breasts should be worked by two schutes each, for more safety. An effective ventilation cannot be formed by such furnaces, and the sooner a steam fan be substituted the better. The draft is too slow, and it needs an air-hole out to the surface. There should be a mandoor outside the downcast, and a door on the gangways to force the air up into the headings. I find a vast amount of water falling in the gangway, and this itself checks the draft. I have given what instructions I deemed prudent to Mr. Rich. Purcell, boss miner, who promised to have them carried out to the satisfaction of all. I directed that horns, eight inches long, should be bolted on the drum, fearing an accident to miners.

Recapitulation.—Slope, 780 feet deep, 22+20+9=189 square feet; four gangways, 3,700 yards long; 22 breasts working; four engines, total power 160 horses; 15 boilers, 440 feet long; 1,650 feet $1\frac{1}{2}$ inch wire rope in use; 220 men and boys employed; 20 mules and 70 wagons in use. Number of visits, 2; distance traveled to and from, 40 miles; do. in the mines, $3\frac{1}{2}$ miles=$43\frac{1}{2}$ miles. Number of persons killed, 5; do. injured, 7: June 16, David Jones, 11 years old, falling in a screen whilst in motion; July 2, John Clark, 28 years old, by a fall of coal; August 21, Michael

Duggan, 25 years old, fell down the slope, by the breaking of the rope—the engine-man to blame; July 3, George Dutchell, died on the 26th, from injuries from a fall of coal; two injured; June 28, Robert Hardy, by a fall of coal; June 25, Jeremiah Campion, a boy, his leg was severely injured while driving, by the displacement of a rail; two others since. No fan in use; one furnace used; five per cent. of air in the long gangway is gas; temperature outside, 84°; do. inside, 58° to 74°; 800 feet outside track, 44 inch gauge, 25lb to the track, 13,325=$2\frac{1}{2}$ miles=99 tons T rail.

No. 48.—Greenwood Slope, No. 1.

Inspected August 20, 1869.

Description.—I herewith submit a detailed statement of the above named colliery, as herewith set forth. The colliery is located about two miles east of the borough of Tamaqua, and 19 miles east of Pottsville, and two miles west of the Old mines in Carbon county, east of the Little Schuylkill river, and north of Panther creek, in the valley formed by the Sharp mountain and the Mine hill, or that spur of the Broad mountain, extending to the old mines. The lands are owned by Pardee & Co., and operated by Eugene Borda. The slope is sunk on the Big vein, 280 yards deep, on a dip of 54°. The coal is 14 feet thick. Section area, 24+26+10=250 square feet, in three different lifts; first lift is 72 yards deep; the second do., 110 yards; the third do., 101 yards deep, and the sump is 30 feet deep; total depth is=320 yards; two tracks, of 4 feet gauge; a pump road and a ladder traveling road from top to bottom, which is kept in good repair. There are two pole pumps in the lower lift, and two working barrels, 16 inches+10 feet stroke. The pump is 140 yards from the slope, and is used for an upcast air shaft. A steam fan ventilates the mines. The breasts are eight yards wide; the pillars six yards thick; only one schute to a breast, and the pillars are headed up at convenient distances, and a chain heading runs along the top of all the breasts. This is a correct plan for ventilating. There are nine yards thick of coal left between the top of the gangways and the headings. I have given such instructions to the boss miner, Matthew Kemp, as I deemed necessary at the time, to get the ventilation much better.

Gangways.—The west gangway on the lower level is 400 yards in and 4 breasts working on it; section area=$13\frac{3}{4}+7+6\frac{1}{2}$ feet=$67\frac{1}{2}$ square feet nearly. The east gangway is 400 yards in and in fault, still the coal is improving as the gangway advances; a large amount of carbonic acid gas is evolved in the gangway and breasts, owing, principally, to the softness of the coal. East gangway, on the middle level, is 800 yards in, and the west ditto is 800 yards in=1,600 yards. The upper level east gangway is 2,200 yards in. The veins are good on the west but a little faulty on the east. The gangways are in good order, the tracks and switches well kept and the drainage tolerably fair.

Ventilation.—The airing of these mines is effected by a steam fan; the pump and traveling road is used for an up-cast air-course. The fan is a 12 feet diameter, 6 paddles 4+4=16 square feet=96 square feet section area, at 70 revolutions. The first air-hole is up to the middle lift, 15 yards east of the bottom of the slope, and will eventually be the main up-cast. Large amount of carbonic acid gas is evolved in this mine, which requires great vigilance to keep it constantly diluted and removed, so that it cannot be-

come an element of danger. This, with the amount of powder smoke, makes it a deleterious element to the health of the miner. However, there is no effort spared to remedy these evils, as the officers are energetic in their duties, and the miners are not to be trifled with, yet not over exacting.

Engines.—Two 40 horse engines in use at the slope on the F vein; rods 3 inches diameter; a 15 feet wheel, 8 arms, rim 4+7=28 square inches; 10 inch+15 feet shaft; spur wheel; 30 inch+12 inch face; a pinion wheel 11 feet diameter, in the centre of the drum; the 2 drums are each 10 feet diameter; 3 spiders on each drum, having 8 arms each, and laged with 10 inch timber; a 10 inch+12 feet shaft—this is the pump shaft; one 80 horse pump, 18 inch+6 feet cylinder; 4 inch rods; 16 feet wheel, 8 arms, 6+8 rim=48 square section; 12 inch+16 feet shaft; 8 feet pinion; 12 inch fan; a 22 inch spur+12 inch ditto; the barrels are 16 inch bore and 16 inch columns; 9 boilers in 3 nests, 30 inches+35 feet long, 3 good valves; grate surface 5+24=120 square feet surface—are examined and cleaned once in 6 months; also a 4 horse donkey engine to supply the boilers; one 500 horse Bull engine, 52 inches+10 feet cylinder, (Allen & Carter, makers;) 8 boilers in 4 nests, 34 inches+36 feet, a steam gauge and 4 safety valves, runs at 70lbs. steam, grate surface 5+22=110 square feet; a 15 horse fan engine and the donkey engine are in the same building with the slope engine; 6 engines of 679 horse power; 17 boilers=603 feet long, all of which are kept in first style.

Remarks.—The buildings are all in fine order, the slope well timbered and secured. The engines in fine order and every attention given to the works. A large amount of black damp is evolved, but the mines are worked systematically; the drainage is good. The fan is located in the engine house, and the outlet near the fan was found by actual measurement to be totally insufficient to ventilate. The section area of the main upcast is 15+12+9=121½ square feet, whilst the section area of the fan outlet is 2½+3=7½ square feet, and the section areas of the 2 headings 18 square feet each. We directed a suitable alteration to be made to remedy the error, and no doubt will greatly add to the proper ventilation. Some builders have an idea that to put the fan in motion is sufficient to ventilate a mine, and how ridiculous it is to create an expense that just does more evil than good.

Recapitulation.—One slope; 3 lifts 323 yards dupt; 2,200 feet of 1½ inch wire rope in use; 6 engines of 679 horse power; 17 boilers 603 feet long, grate surface 255 square feet; 280 men and boys employed; 32 mules and 75 wagons in use; daily shipments, 100 railroad cars; 2,080 yards outside track laid; 4 gangways=4,200 yards; total length of T rail laid=3⅔ miles nearly; distance to Pottsville and back, 38 miles; inside and 7½ miles=45½ miles; number of visits, one; one fan in use; 1 killed; injured; temperature outside, 74°; ditto inside, 54° to 66°. Officers' names: boss miner, Matthew Kemp; first engineer, Nicholas Conrow; second do., Henry Walters; third do., Walter Scheltzs—fully capable men; 23 breasts 30+200; 18,840 track, 3¾ miles=142⅓ tons T rail.

No. 49.—Bull Run Slope.

Inspected August 21, 1869.

Description.—This slope is owned by Pardee, Roberts & Co., and operated by Eugene Borda; this colliery is located one mile east of Greenwood slope, on the same side of the valley, 3 miles from Tamaqua and 20 miles east of Pottsville; it is sunk on the Big vein, 228⅓ yards deep; section area, 30+28+12 feet=348 square feet; 2 tracks, 4 feet gauge of a 40lb rail, laid to the old level, distance of 105 yards, and a single track laid to the bottom, distance 123⅓ yards; the other track is in progress of completion; 1,690 feet 1½ inch wire rope is used; a cage is used in the slope to hoist the wagons with; the vein consists of different stratas of coal and slate, e. g. the D vein is 8 feet thick and has 18 inches of parting slate, 2½ feet of gray ash and 3½ feet clear; 5½ feet of slaty stuff, and 5 feet of sulphur stuff, with 1 foot of a bench over that; then 4 feet of coal and 4 feet of coal and slate; then 7 feet of good coal, and from 4 to 6 feet of coal and dirt, and mixed over that again is 4 feet of coal, and at top 3 to 4 feet of coal; in all 60 feet thick; of this there is 16 feet of dirt and coal, and 42 of good coal; breasts and pillars each 10 yards thick and run up 175 yards.

Gangways.—The west gangway is 700 yards in and has a run of 4,400 yards to the boundary line, which is the line of the western boundary of Carbon county; the east gangway on lower level is 100 yards in; area of the gangway is 63 square feet; and 5 breasts working on the same; there are 5 veins on the tract: first, the Big vein, 60 feet thick; the F vein, 12 feet thick; the E vein, 42 feet thick; the D vein, 9 feet thick, and the crosscut vein, 9 feet thick; the total thickness of coal in the 5 veins is 132 feet; of this 16 feet of impurities exist, leaving 116 feet of coal for use; the west gangway runs in 2,600 yards to the boundary line, and 100 yards eastward= ,700 yards; the 4 gangways now open=3,500 yards, and 4,400 yards of track, of 48 inches gauge, laid outside; aggregate length of tracks laid with a 25lb rail=7,900 yards or 4½ miles nearly.

Ventilation.—A furnace is used to ventilate these mines; the shaft is used for a downcast; the first airhole is 30 feet from the slope, and runs up to the upper level; the air-course on the north gangway is on the upper side, and is 14 square feet area, and is used as an upcast air shaft, area of which is 33 square feet, drove into a breast and thence by a shaft drove out to the surface. I found the furnace ventilation here to be quite good; there is a crosshole to the slope, and the pillars are holed from breast to breast; their cross-headings are 12 square feet area; they should be 20 square feet; the temperature outside, was 74°, and inside, from 62° to 71° at face of the long gangway. The day being foggy and wet, I found a large body of powder smoke and carbonic acid gas here, and the miners complaining of headaches and sickness, and appealing for relief. The works being new, it is an easy matter to effect a proper ventilation by erecting a 14 feet fan, of a 15 horse power, and by keeping check doors on the gangways, and making the headings and manways of sufficient area; the air can be forced forward with greater rapidity to the face of the works, and returning, will traverse the breasts and dislodge the vitiated air, and will generally improve the condition of the air. Mr. Williams promised he would have these instructions carried out.

Engines.—Two 50 horse engines are used for the slope, 16 inches by 14 feet cylinder; 2 drums, 8 feet diameter each; 3 spiders, 8 arms each, 7 inch laging; 3 pinion wheels, 8 arms, 12 inch face; 1 shaft, 12 inches by 16 feet; 1 shaft 12 inches by 10 feet; 14 feet fly wheel, 8 arms, 5 by 9 inches rim; 1 pump wheel 8 feet diameter, 8 arms, 14 inches face; 12 inches by 14 feet

shaft; engine, link motion, rods 3 inches diameter; 2 pumps, 16 by 8 feet stroke; 5 boilers in two nests, 34 inches+36 feet long=180 feet; grate surface 4½×by 14 feet=63 square feet.

Remarks.—Everything in and out of the colliery is carefully attended to, except the ventilation, and that can be successfully accomplished by a steam fan. This course I have advised the firm to adopt, as it will greatly tend to dry up the mines and add much to the preservation of the timber, besides the great importance it will be to the miners, and add to the interest of the operators. The pumps and engines work well. I gave such instructions and advice to Mr. Williams as seemed proper at that time, and I trust he may carry out the same reforms.

Recapitulation.—One slope, 30+28+9=348 square feet section area. This is the largest slope in the county. Two tracks; two pump roads; the slope 228⅓ yards deep; five veins, 116 feet thick of coal; four gangways, 3,500 yards long; 1,690 feet 1½ inch wire rope in use; 4,400 yards outside track laid, with a 25lb rail, 48 inch gauge; total length of tracks inside and out=4½ miles, nearly; five boilers, 180 feet long; 15 breasts, 10 yards wide each and 55 yards long, now working; 45 men and boys employed; 175 wagons and 11 mules in use. Officers' names—boss miner, Morgan Williams; first engineer, James Cook; second do., Daniel Schelly. No. of visits, —; No. of persons killed, —; do. injured, 2. Distance to and back, 40 miles; in and out of the mines, 3 miles=49 miles. Ventilation, one furnace; air 5½ times too slow; nine per cent. of the air in the mines is gas; five per cent. of the water is mineral salt; air 8½ times slow; 4½ miles track=168½ tons T rail; 16 breasts, 200+30 feet; 24 feet pillar; one visit, 40+3=43 miles; temperature outside, 74°; inside, 71°; shipping capacity, 100 cars to 80 do. per day; one year in operation.

No. 50.—Bull Run, No. 1.

Inspected August 21, 1869.

Description.—This colliery is also belonging to Pardee & Co., and is located a mile east of the Bull Run No. 2 colliery, 21 miles from Pottsville and about four miles from Tamaqua, near the eastern line of the territory of Schuylkill county, in the same valley, and approached by the Lehigh Valley railroad. The Philadelphia and Reading railroad comes within a few poles of the colliery, in curving round to the Bull Run No. 2. The colliery consists of a tunnel, drove north some 400 yards from the breaker to the Big vein; the tunnel is four hundred yards long, to where it reached the vein, making it eight hundred yards from the breaker to the vein. The vein is 60 feet thick. There are 35 feet of good coal in the vein; the remaining 25 feet is stratified with different matters. The surface is composed of a strata of loose gravel, 13 yards thick. The east gangway runs 1,400 yards, the west do. 700 yards, up to the line. The breasts are 10 yards wide, the pillars are 11 yards thick, and each breast worked by one schute, and runs up 45 yards each. If worked much higher they step in and fall through. Many of the breasts are filled with rock, and are abandoned. The gangways are of an area of 68 square feet, and the timbers six feet apart. Eight breasts receive moderate air, and all the works outside of these are good. The inlets are too small, and the air cannot have free action in the mines in consequence of this error. The operator, Mr. Eugene Borda, uses a small locomotive engine to do the

hauling inside and out, and it does its work admirably and with dispatch. A dirt plane, 300 feet long, on a 25° pitch, at the breaker, to facilitate the removal of the waste from the premises.

Gangways.—The west gangway is drove in 700 yards, the east do. 1,400 yards=2,100 yards; area of the gangways=63 square feet; about 14 breasts working in the mine; the pillars are all standing.

Ventilation.—A furnace ventilates these mines. The first air-hole is located at the end of the tunnel, at the junction of the east and west gangway, and is drove up 68 yards, to surface. There are six air-holes on this gangway. The third air-hole is the new downcast, and the tunnel is 650 yards outside of it. Its area is 15 square feet, and a cross-hole drove through the pillars from door to door. The air is carried through a 14 inch board pipe, to the face of the gangway. This is too small, as the air-courses inside are leaking, and in consequence reduces the force of the volume of air, which cannot operate effectively on the smoke and carbonic acid gas evolved. The miners complain of this element existing abundantly in the breasts. To remedy this existing evil, I recommended an air-hole to be opened eight yards from the fall of the gangway, and head it into the last upcast; one heading at the battery, and two manways at each breast. The thermometer stood at 52° here. There are 240 yards from air-hole to air-hole, along to the shaft, to keep up the ventilation; and if the track line be too close, to drive another out. The air is bad in the inside schutes, but I discovered no (fire-damp) carburetted acid gas in any quantity in the mines, yet it is evolved, but the volume of carbonic acid gas is much greater, and therefore destroys its power of absorption. The inlet was found too small. I recommended double check doors to be placed on the gangways. This would secure a continual current through the works; all of which instructions were promised to be accomplished.

Engines.—A 20 horse locomotive engine, used for general heating inside and out; a 30 horse breaker engine, 10 feet wheel, 8 arms, rim 6×4=24 square inches, rods 2½ and 3 inches diameter, 9 inch by 14 feet shaft, with governor attached; 2 boilers 30 inches+30 feet=60 feet; grate surface, 5×7=35 square feet; one 8 feet pulley, 8 arms, 16 inches face, and one 3 feet ditto; two gum belts, one a 50 feet and one a 40 feet; dirt plane drum 5 feet diameter; 2 spiders, 8 arms each; 2 screens, 5 feet diameter, 30 feet long; 2 small ditto, 3½ diameter and 8 feet long; the employees and boilers are separated by a stone wall; in the event of an explosion, the wall would, in that case, be dangerous to the hands employed in the breaker.

Remarks.—The interior and exterior of the mine are kept in good order. I recommended a fan to be erected at the junction of the east and west gangways with the tunnel, and a series of check doors placed in the gangways, that would force the air to the face of the works, returning back through the breasts by the headings in the pillars to the fan upcast; this done, the tunnel to be used as an inlet, the steam could not get through the works further than the inside depot, where a sliding door could be used to admit the steam into an outcast going to the fan; in this way the colliery can be permanently aired. I do approve of the locomotive used in mines, as it is much cheaper, safer, satisfactory, fraught with much less danger and affords a quicker dispatch.

Recapitulation.—The colliery consists of one tunnel; two gangways, =2,100 yards long; one vein, 60 feet thick; coal, 35 feet; stratified matter, 25 feet; the mercury outside, stood at 73°, inside, from 50° to 52°; difference, 23°; 105 men and 77 boys employed; 29 mules and 84 wagons in use; vein dip, 51° south; 300 feet dirt plane; 420 feet one inch wire rope; number of visits, 1; distance to and from, 42 miles; do. in and about the

mines, 4=46 miles; killed, —; injured, —; air, $6\frac{1}{3}$ times below the standard; fans; furnaces, 1; breasts, 13; distance from tunnel to line of tract, $2\frac{1}{2}$ miles=4,400 yards. Officers' names: Boss miner, Evan F. Williams; engineer, John Deal—both competent men; 5,000 outside track, 44 inch gauge, 28lb rail.

No. 51.—Mammoth Shaft.

Inspected August 24, 1869.

Description.—I herewith submit a detailed description of the said colliery, as herein set forth. This colliery consists of a shaft, 364 feet deep, on the Big P vein. There are four veins operated in this shaft—*i. e.*, the Big P vein, the Little P, the Big Q and Little Q veins. All the four gangways running west. The section area of the shaft is $13\frac{1}{2}+9\frac{1}{2}$=square feet. There are two cages used to lift the wagons. The shaft is located south of the borough line of the town of Tamaqua, on the northern slope of the Sharp mountain. The situation is picturesque, overlooking the Little Schuylkill river and the surrounding valley. The engine house is of stone, and the other buildings are all wood, and as a whole are very substantial. Owing to the deep gap here in the mountain, the gangways cannot be drove eastward on the present lift. The track is leased to Pardee & Co., and operated by Mr. Eugene Borda. The upper levels are all worked out. The mines are ventilated by a furnace. The shaft is used as a downcast. The measures of these veins are much confused on the north slope of the Sharp mountain its entire length, and they dip north at an angle of 85° invariably. The P and Q veins split off into two other small veins, named the Little P and Q veins, with tunnels drove through them at proper distances, with gangways turned eastward, to facilitate the working of the mines. The first tunnel on the P vein to the Little P is 80 yards from the shaft, and is continued diagonally to the Q vein, some 30 yards, and thence to the double Q, 10 feet; the main gangway being on the P vein, and crosscut holes made from gangway to gangway, at intervals of 50 yards, for the purpose of ventilation. I found much suffering here from the effects of carbonic acid gas and smoke in the faces of the gangways. I recommended the use of a fan ventilation, which was concurred in by the boss miner, Ralph Notrass.

Gangways.—The west gangway on the Big P vein is 2,000 yards in; the tunnel is 100 yards long; the two gangways on the Little P vein are 100 yards each=200 yards; the two east and west gangways on the double and single Q's are each 900 yards in=3,600 yards, with 200 yards of crossholing between them, and by adding the depth of the shaft, 122 yards, will make a total of 6,122 yards; average section area=$10\frac{1}{4}+6\frac{1}{4}+7\frac{1}{4}$=60 square feet nearly, and 500 yards outside track=6,622 yards of T rail of 25lbs. and 48 inches gauge.

Ventilation.—The shaft is used as a down-cast. The main air-course is on the Big P vein gangway, and is of an area of 20 square feet section. The furnace is located on this air-course at the surface, and an escape traveling way for the miners out. The air is forced in by means of stop doors on the gangway, through the crosscuts, up the breasts and back through the headings in the pillars to the furnace out-cast at the surface.

Engines.—A breaker, shaft and pumping engines; a 60 horse shaft engine; 2 forties=80 horse engines for hoisting coal; 800 feet $1\frac{1}{2}$ inch wire

rope; 1 dirt plane engine, 30 horse; 2,300 feet wire rope in all; 1 plane 600 feet long; 50 horse breaker engine; 5 engines, 220 horse power; 16 boilers=456 feet long, grate surface 192 square feet.

Remarks.—I found the mines suffering in a measure from foul air, and the air 5½ times below the standard of ventilation. I recommended the use of a fan, and am informed by letter the company is erecting a fan. There is also a safe escape traveling road independent of the shaft for the miners to get out by. To work these veins is difficult owing to their great angle of inclination. There are 4 separate veins on the tract, and their great distance west requires the effective force of a steam fan to effect a thorough ventilation. The drainage is good and the general condition of the mines is favorable.

Recapitulation.—The shaft is 122 yards deep, area 128½ square feet section; 4 gangways running west; total distance, 6,122 yards; area of gangways, 60 square feet nearly; number of engines, 5; number of horse=220; boilers, 16=30+30+28=456lb; force employed, 200 men and boys; 20 mules and 50 wagons in use; killed, —; injured, —; 2,300 feet of 1⅝ inch wire rope in use; distance to and back, 36 miles, in and out of mines, 3 miles=39 miles; temperature outside, 78°; ditto inside, 56° to 62°; difference, 22°; escape roads, 1—good; grate surface, 192 square feet. Officers' names: Ralph Natrass, boss miner; air found 7⅓ times too slow; shipping capacity, 55 cars per day; a 60 horse shaft engine for pumping; two forties for hoisting; 800 feet 1½ inch wire rope in use; 600 feet dirt plane; 1,500 feet 1⅝ inch wire rope in use; a dirt plane engine, 4,030 horse power, and a 50 horse breaker engine=5 engines=220 horse power; 16 boilers in use, 30 inch=30+28 feet=456 feet long; grate surface=192 square feet; acid in water, 12 per cent.; gas, 14 per cent.; black damp, 10 per cent.; shipping capacity, 14 cars per day—could ship 80 cars; 2 escape traveling roads independent of the slope.

No. 52.—High Mines, Tamaqua.

Inspected August 25, 1869.

Description.—This colliery consists of a drift on the north side of the borough of Tamaqua, and south of the Little Schuylkill river, in the gap of the mountain, on the lands of the Greenwood coal company, leased and operated by John Johnson. The coal is hauled up to the breaker by an inclined plane, and are operating two veins, the A. and C. veins. The coal is very good; the breasts 8 yards wide; the pillars 4 yards thick; one schute to a breast; a pillar 25 feet thick is left standing, to support the old counter level gangways, and use them to drain water; yet a great mass of water is falling in the lower gangway, which overflows the road. The A vein coal is 12 feet thick and hard; the C vein coal, 6 feet thick, and good. The company is repairing the C vein—400 yards are repaired and 300 yards to be repaired=700 yards. The A vein gangway is 750 yards in=1,450 yards of gangway—all above the railroad level. The area of these gangways is 50 square feet section.

Ventilation.—The ventilation is effected by air holes. The air is carried into the face of the gangway by heading from breast to breast, and principally depending on atmospheric action to draw it through the headings and manways. The last air hole is 50 feet from the face of the A gangway; this hole is run up into the old counter gangway, 250 yards from the

mouth of the gangway to where the A vein splits off south and then east, running parallel with the A vein.

Engines.—One 30 horse engine at breaker in good condition; 2 boilers 30+26 feet long.

Remarks.—The premises appear much worn, yet they are sufficient to endure for some years to come. The gangway is exceedingly wet. There is a large body of black-damp mingled with powder smoke and vapor floating about in the mines. I recommended doors to be placed on the gangway, and the air-holes enlarged, so that a better circulation could be effected. This once established, erect a fan or a furnace on the surface, and, owing to the altitude of the mountain here, the furnace could effect a perfect supply of air to ventilate the mines.

Recapitulation.—2 drift gangways 2,100 yards in; 9 breasts working; area of gangway, 60 square feet; one 30 horse engine; 2 boilers 30+26= 52 feet long; 200 feet inclined plane, 2 tracks=400 feet; 1,500 feet outside track, 40 inch gauge, 25lb rail; 500 feet $1\frac{1}{4}$ inch wire rope in use; 44 men and boys employed; 3 mules and 9 wagons in use; killed none, and none injured this year; mileage, 36, in and out of mines, 2 miles=38 miles; air, $6\frac{2}{3}$ times too slow. Officers: John Winsel, boss miner; engineer, Frank Munday; temperature, outside, 73°; inside, 48° to 51°; capacity of colliery, 30 cars per day; shipping 15 ditto, ditto.

No. 53.—Beaver Run Drift.

Inspected August 26, 1869.

Description.—These mines are now opened by a tunnel drove south to the Big vein 140 yards in, in solid rock. Just turning a gangway on the east side. The lumber for building the breaker is on the premises. The mines are approached by a branch of the Philadelphia and Reading railroad, diverging at Mahanoy City, and running up Beaver creek some $2\frac{1}{2}$ miles north-east of that town. It is 33 miles, by rail, from Pottsville, and located on the Delano estate, leased and operated by Hammet & Bowman. Mr Bowman is superintendent and mining boss. The vein is just open and it is expected it will soon become a good colliery. At present the rails are not laid, but tracks are graded. On the north side the valley stretches out level, whilst on the south the rise in the hill does not warrant much of a dip; at present the dip is confined to 23°. Further comment is unnecessary at present, as nothing requiring a further investigation presented to us. Mercury stood at 80°, and inside ditto at 50° to 47°; difference, 33°; 16 men; 1 mule; 5 wagons; 100 yards track, 25lb rail, 44 inch gauge; total length, 240 yards; none killed or injured; no fans or furnace; no engines; air furnished by atmospheric action. The colliery is just newly open, and a good prospect appears to follow.

No. 54.—St. Nicholas Slope.

Inspected August 27, 1869.

Description.—I herewith submit a detailed description of the above named colliery, as herein set forth. This colliery is located on lands of the Philadelphia coal company, two miles west of Mahanoy City, and 32

miles north-east of Pottsville, by railroad. It is situate on the north side of the Mahanoy and Ashland railroad, on the Wastehouse run. The slope is sunk on the south dip of the Big vein. The mines were formerly leased and operated by Hon. H. L. Cake, but at present are operated by F. & E. D. Denison. The track has six workable veins on it: first, the Primrose vein, 10 feet thick; the Big vein is 100 yards north, and is 16 feet thick; the Four-foot vein is 10 yards north and four feet thick; the Seven-foot vein is 15 yards north and is seven feet thick; the Skidmore vein is 60 yards north, and is 14 feet thick; and the Buck Mountain vein is still 100 yards north, and is 18 feet thick; making the distance from the Primrose to the Buck Mountain veins 285 yards. The thickness of coal in these six veins is 69 feet. The Big and Skidmore veins are working; so that a tunnel north and south from the present slope cuts all the veins. The west gangways only can run 190 yards, but the east do. can run 2,640 yards. The slope is 122 yards deep, and dips 50°. A six feet track is laid in the slope, and the wagons lifted by a cage, and hauled to the breaker and elevated to the rolls when the coal is prepared for shipment. Area of slope, 24+29+12=318 square feet; section area of gangways, 11+7+7=63 feet section. The mines are ventilated by a fan. The track is well timbered. The water is brought 1,400 yards, down the Cellers run. The contiguity of the colliery to the railway affords great facility for shipments.

Gangways.—The Big vein gangway east is in 1,760 yards; the Skidmore do. is in 1,760 yards; the counter gangway on the Skidmore vein is 1,200 yards in; the three gangways are =4,720 yards long; the breasts 10 yards wide and 80 yards long; the pillars six yards thick.

Ventilation is effected by a fan, placed 40 yards from the slope. The slope is used as a downcast inlet. An air-shaft on the Skidmore, 150 yards from the eastern line of the track, and it runs out to the surface. The fan is open all round, and in consequence cannot act on the mines with proper force. The pump road is also used as a downcast into a breast in the west gangway, and thence returns, through seven breasts, to the east do., and airs the eastern works, to a dog hole, 100 yards east of the slope, to a door; thence pass in the dog-hole to the face, and over the top of the collars, and thence returns through the breasts to the outcast of the fan. The fan air-hole starts 12 yards from the bottom of the slope, and runs out at the surface, forty yards from the slope. Another air-hole on the counter gangway, 80 yards from the fan, outcast. I found the air poor in all the gangways in the mines.

Engines.—Two 60 horse engines used at the slope, (link motion;) one 80 horse pumping engine; a 16 horse fan engine, with 14 feet fan; eight paddles, $4 \times 4\frac{1}{2} = 18$ square feet=144 square section; a 60 horse engine runs the breaker and saw-mill; six boilers, 30 inches+30 feet long=180 feet, and six boilers for slope use, 34 inches+30 feet=180 feet long; a 60 horse steam pump, double acting, in the slope; two suction pipes, one of which is of wood; two cylinders, 18 inches diameter, and six feet stroke. Such pipes are preferred to best iron pipes, where the water is so strongly impregnated with mineral salt. Six engines=276 horse; 12 boilers=360 feet long.

Remarks.—I recommended the closing of the fan, except a discharging orifice of an area of 60 square feet. I found a large collection of powder smoke in the gangways. I desired Mr. Evans to run out an air-hole in the last breast on the Skidmore gangway, to the surface, of an area of 36 square feet, which would make a perfect air-course through the upper works, and relieve the air in the gangway; and another drove on the Seven-foot vein to the surface, and to place the fan on it, as it would be more central to

operate more central, and air both veins equally. I directed the brattice to be cut inside the door, at No. 9 breast, and put a door at every other breast, and thus force the air to the face of the work, and return through the cross-holes in the pillars, into all the working breasts; close all the finished breasts with plank batteries. By this means a sufficient current of air can be formed. Thirty-seven breasts are working in the mines.

Recapitulation.—Slope 122 yards deep; 550 feet 1⅜ inch wire rope; 3 gangways, 4,720 yards long; area of slope 29+24+12=318 square feet section; capacity of daily shipment, 80 cars; area of gangway, 630 square feet; area of fire grate, 152 square feet; 12 boilers, 360 feet long; 6 engines=276 horse power; number of working breasts, 37; a 16 horse fan; number of visits, 2; distance to and back, 64 miles, in the mine, 5 miles—total miles traveled, 133 miles; killed, none; injured, none; 20 per cent of impure air; condition of air, 7⅓ times too slow; 225 men and boys employed; 14 mules and 50 wagons in use: 700 yards of track of 25lb rail; 48 inch gauge; total length of track laid, 5,542 yards of 25lb T rails. Officers' name, Lewis Evans; temperature outside, 74°; inside, from 46° to 58°; state of the water, 8 per cent. mineral alumina; date of operation, 12 years.

No. 55.—Hill and Harris Slope.

Inspected August 30 and 31, 1869.

Description.—This colliery is located on the estate of the Delano coal company, leased and operated by Messrs. Hill & Harris. It is north of Mahanoy City, near the borough line, and north-east of Pottsville, 30 miles by rail, 12 miles west of Tamaqua, and 12 miles east of Ashland; it holds a desirous position in the coal region. It is approached by the branches of both the Quakake and Philadelphia and Reading railroads; the slope is 122 yards deep, sunk on the south dip of the Mammoth vein; section area 26+22+10=240 square feet; the buildings are all new and in excellent condition; there are five veins on this track: first, the Mammoth vein, 20 feet thick; second, the Primrose vein, 10 feet thick; third, the Red Ash, 4 feet thick; fourth vein, the North dip 12 feet thick; fifth, the Diamond vein, 8 feet thick=64 feet of coal; the slope is newly put in operation; there are three drifts in on the water level, and all are in operation; the slope has two tracks, one pump road, and a traveling road out to the surface; the coal from these drifts is hoisted by an incline plane, and self-unloaded; the fixtures in the breaker are finely arranged, and all approaches to danger closed; the coal is of a superior quality, and abundant in quantity.

Gangways.—The west gangway in the slope is 200 yards in, has 6 breasts 12 yards wide each, and 6 yards pillar, and 2 schutes each, and run up 80 yards; the east gangway is in 100 yards=300 yards; the old west ditto is in 1,600 yards; the Primrose vein is 77 yards from the Red Ash vein; the east gangway on south dip is 60 yards in; the west ditto is 300 yards=360 yards; a new gangway is to be open on the north dip; the north dip gangway on the Primrose vein is 600 yards in, to the Diamond vein tunnel, and 400 yards to the face=1,000 yards, where it terminates in a fault; the Big vein gangway runs west 1,660 yards on the old level, and 800 yards more to the Glenville tract, and touching the Maple Deal tract; 7 gangways=4,920 yards; some 37 breasts working on them.

Ventilation.—A 10 horse fan ventilates these mines; the air-course is carried along the bottom of the gangway, and is 6 feet from it; this is the east

gangway in the slope; the fan is located 20 yards west of the slope and airs it well; the drift gangways are not so well aired.

Engines.—One 80 horse hoisting engine at the slope, link motion; two drums, 8 feet diameter, each having 3 spiders, 6 arms each; 2 shafts, 12 inches+10 feet long; a 15 feet wheel, 8 arms, rim, 6×9 inches=54 sections; shaft 12 inches+9 feet long; 2 pinions, 8 feet diameter; 6 boilers in three nests, 34 inches+30 feet=180 feet long; 3 safety and 3 check valves, well cleaned, running at 90lb; boilers new; grate surface, 5×18=90 square feet; a 30 horse dirt plane engine; drum 5+7 feet long; 3 spiders, 4 arms each; shaft 4½+8 feet; one 7 feet pinion on a 9 inch+18 feet shaft; 10 horse fan engine, (a circular cylinder, New York,) 8 paddles 4½×4=18 square feet=144 square feet section; the drum in the water level is 6 feet diameter; 3 spiders, 8 arms, 8 feet long; a pinion on a 10 inch+9 feet shaft; 4 boilers, 30+20 feet=80 feet; two valves, running at 80lb steam; one 50 horse engine=16 feet wheel, 8 arms, 6+8 inch rim=48 inches section; this fly wheel is used for a belt pulley, and laged with 2 inch plank, 30 inches face; there are 4 pulleys on the shaft; first pulley runs an 18 inch +72 feet belt; second ditto runs a 12 inch+182 feet belt; third runs a 14 inch+65 feet belt, and fourth runs a 12 inch+65 feet belt—total length of beltings is=384 feet long.

Remarks.—The slope is quite new and the buildings are in a creditable condition. There is a basin of 72 feet thick of coal between the Primrose and Red Ash veins. I located the place for a door in this gangway. There is a perpendicular shaft with a furnace in it in the tunnel between these veins. The door is to be between the air-hole and the dog-hole, and outside the air-hole to force the air west, as both gangways are full of smoke and unhealthy air; the air then to return by the dog-hole eastward to the upcast air-hole on the middle basin, where it is intended to open a new counter gangway on the north dip. I recommended a door to be placed between the upcast and gangway after leaving the south dip, which will air the west gangway back, and its work also. These changes I recommended, and were promised to be fully carried out, and if so, I am persuaded it will have a beneficial effect, as the ventilation of a mine is of the greatest interest to all parties. I therefore recommend that the airing of a colliery should be one of the first objects in view from the outset until the final closing of the works, and the important object to furnish a full supply of fresh air to the miners at all times and seasons, and this object should be paramount to all other considerations.

Recapitulation.—A slope 122 yards deep, south dip 25°; 4 tracks; 2 wagon tracks; a stepped traveling road and pump road; 7 gangways, 4,720 yards long; 37 breasts working; 700 yards outside track, 48 inch gauge, 25lb rail; 100 feet coal plane; 1,874 feet of wire ropes; 4 engines=170 horse power; 10 boilers=260 feet long; one 10 horse fan; one furnace; distance to and back, 60 miles; 2 visits, 120; in the mines and outside traveling, 5 miles=125 miles; percentage of gas, 3; ditto smoke, 6=9 per cent. vitiated air; 200 men and boys employed; 14 mules and 60 wagons; escape roads, 3; condition of air, 6 times below the standard; capacity of shipments daily, 70—can ship 100 shortly. Officers' names: John Holland, boss miner; first engineer, J. R. Williams; second ditto, N. Garrett; third, Robert Kane; fourth, John Wooley; temperature outside, 80°; ditto inside, 46°, 54°, 56° and 72°.

No. 56.—Primrose Colliery.

Inspected September 1, 1869.

Description.—I herewith submit a detailed description of this colliery as herein set forth. The colliery is located on the Richard Kear and Burd Patterson property, on the eastern limits of Mahanoy City, 30 miles, by rail, from Pottsville, contiguous to the Mahanoy and Ashland or Philadelphia and Reading railroad. The colliery consists of a drift running east on the Primrose vein. The vein runs eastward to the Beaver run tunnel colliery. The drift is in 950 yards and there splits off to a south-east gangway, which runs in 900 yards, curving gradually north, both gangways being 200 yards apart in the middle and 720 yards apart near the boundary line; the main drift gangway is still in 800 yards more=1,750 yards. The boundary line on the extreme east side is within 10 yards of the western line of the Beaver run tunnel colliery. There are 10 breasts on the north and 9 on the south gangway. The vein dips 18°, and forms a basin of 75 yards broad.

Gangways.—The drift gangway is in 1,750 yards; the south splice do. is in 900 yards; 19 breasts working on them. The tracks are in a miserable condition, for want of drainage. One gangway has a run of 700 yards, the other 400 yards, to the line; the track is a 48 inch gauge, laid with a 25lb rail. The smoke and dirt in these gangways are without excuse, and should be remedied.

Ventilation.—Neither stack, furnace or fan is used in this mine, and the powder smoke, mingled with black-damp and vapor, is almost unendurable, the road almost covered with mud and water; and this is the only one I found in such a condition in the region. The miners are suffering from the poor management carried on here, and the whole gangways in a shockingly bad condition.

Engines.—One 25 horse breaker engine; two boilers. 30 inches+24 feet long—considered good; the water is spring water; 280 feet of belting attached; the coal hoisted on a double-track incline plane; the buildings are good frame buildings.

Remarks.—I asked for a transcript map of the mines. I have attempted to state the condition of the mines and gangways. The colliery needs a fan to ventilate it, and the drainage is sorely needed, the water being impregnated with about 12 per cent. of aluminum. The headings are too small, only nine square feet, whilst the standard area is 36 to 69 square feet. This appears to be bad economy. I recommended all air-courses to be enlarged, of an area not less than 30 square feet, and to cut a manway in every second pillar, or else make a jugular air-hole in every breast, and to carry the air over the gangway, near the top slate, and convey it by a brattice to the face of the work, so as to furnish sufficient air for the miners, and dilute the noxious air and force it out by the air-holes. The mining boss, John Williams, promised to fulfill all these obligations.

Recapitulation.—One drift, with two gangways, 2,650 yards long; one 25 horse breaker engine; 19 breasts working, each 12 yards+80 long; four yards pillars; no stack, furnace or fan used; other gangways, (old,) drove on other veins=3,400 yards; total length of all gangways is=6,050 yards; 96 employees; 10 mules and fifty wagons; daily shipments, 50 railroad cars; one visit, 12 miles; in and out of the mines, 5 miles=67 miles; percentage of vitiated air, 12; do. mineral salt in water, 8; escape roads, 2; condition of air, 19 times too slow. Officers' names: Operators, Chas. Nevlis & Bros.; boss miner, John Williams; superintendent, John Deach; temperature outside, 80°; do. inside.

No 57.—Middle Creek Slopes.

Inspected September 2, 1869.

Description.—I herewith submit a detailed description of the above colliery, as herein set forth. The colliery is located at Middle creek, three miles east of Donaldson and 3½ east of Tremont, on lands owned by the Tremont coal company, and operated by them at present. It is 14 miles west of Pottsville, on a branch line of the Mine Hill railroad. Some years ago this was one of the most flourishing collieries in the county, but now the upper levels are nearly exhausted. The company contemplate to sink to the basin, and in a short time will be able to resume operation on a large scale. There are three slopes now on the colliery. The large deposit of coal anticipated to be reached is immense, considering the gradual inclination of the dip of the axis of the veins. No. 1 slope is sunk on the Big vein, 107 yards deep. The coal on this level is nearly mined out, and the slope is to be re-timbered, and hereafter to be used as an outcast for a large fan, when the air courses on the other two slopes are completed; all of them will then be ventilated by the fan on No. 1 slope; and all the water pumped from the lower levels of Nos. 2 and 3 slopes, up to the tunnel level, will pass to No. 1 slope, and there pumped up to the water level, and thence flow off to the creek. This plan is well arranged, and in a short time it is expected it will be accomplished.

Gangways.—The west gangway on No. 1 slope, is 1,780 yards in; the east ditto, 9 4 yards=2,744 yards; all the breasts of all these gangways are 10 yards wide, and the pillars 6 yards thick; the coal on this level is all mined, and will now be used for an air-course; ventilation, none.

Engines.—One 30 horse pumping engine, 14 feet wheel, 8 arms, rim 5×8=40 inches section; feet pinion; 2 shafts, one 8 inches+10 feet; and one, 10 inches+10 feet; the steam received from the breaker boilers; a 20 horse breaker engine, 10 inches, 2½ feet cylinder; 10 feet wheel, 8 arms, rim, 5×8=40 inches section; 8 inches+9 feet shaft; the fly wheel used for a pulley, laged with 3 inch plank, 18 inches broad; two gum belts, one 50 feet, and one 40 feet; a governor attached to the engine; six boilers, 30 inches+20 feet long; the boilers good.

No. 58.—No. 2 Slope.

Inspected on the same day.

This slope is sunk on the south dip of the Big vein, and is now idle; having examined the mines, and found them in comparatively good condition; there was no person working inside.

Engines.—One 40 horse, 16 inches+3½ feet cylinder; 12 feet wheel, 6 arms, rim, 5½×8=44 inches section; 10 inches+7½ feet shaft; 5 feet drum, 10 feet long; four spiders, 8 arms each, laged with 9 inch plank; a 7 foot pinion, 8 arms, 12 inches face, and 22 inch spur wheel; 1,000 feet 1¼ inch wire rope; 250 feet ¾ inch chain on dirt plane; 3 good boilers, 36 inches+26 feet long, in good condition.

No. 59.—No. 3 Slope.

Inspected September 2, 1869.

This slope is also sunk on the Big vein, 36 yards to the water level, and 119 yards to the bottom=155 yards, this makes 4 lifts; the coal is 10 feet

thick; the drift now working on the east side is 1,500 yards in, and 94 breasts on it; these breasts run up 30 yards; 400 yards of $\frac{3}{4}$ inch chain used in the slope; there are two veins worked in this slope; the 10 foot vein is $5\frac{1}{2}$ feet thick here, and the Big vein is 10 feet thick; these slopes now labor under great disadvantages; still ship some 25 cars per day, and are diligently laboring to ship in a short time, 50 cars a day.

Gangways.—The west gangway on the middle level, is 1,700 yards in; the east ditto is 964 yards; the west ditto on the water level, is 500 yards in; the east ditto is 500 yards in; the west ditto on the lower level is 545 yards in; the east ditto is 720 yards in; the old top gangway, west side, is 500 yards in: in all, 7 gangways=5,479 yards long, is equal to 342 breats, each 10 yards wide; the pillars 6 yards thick; the pillars are still standing.

Engines.—Two 50 horse slope engines, 16 inch+4 feet cylinders, 16 feet wheel, arms, rim 6×9=54 inches section; one 7 feet pinion, 8 arms 14 inches face; 2 chain drums, 9 feet diameter each; 6 boilers in 2 nests, 26 inches+26 feet long=156 feet.

Recapitulation.—The colliery consists of three slopes—one is 107 yards deep; No. 2, is 110 yards deep; No. 3, is 155 yards deep=372 yards dip, 2 tracks each=744 yards track of 48 inch gauge; 12 gangways=12,223 yards long=7 miles nearly; 5 engines=190 horse; 15 boilers=354 feet long; 150 employees; 14 mules; 58 wagons; 400 yards $\frac{3}{4}$ inch chain; 1,300 yards $1\frac{1}{4}$ inch wire rope; 4 escape roads; no fan; none killed or injured; air no account; capacity of shipments, 25 cars per day. John Terpin, boss miner; number of visits, 1; distance to and back, 28 miles; traveled in and out of mines, 8 miles=36 miles; temperature outside, 79°; inside ditto, 55° to 66°; 2 days on inspection is equal to 64 miles in all; air $7\frac{3}{4}$, $8\frac{1}{2}$, $11\frac{1}{4}$ slow; 1,680 outside tracks 44—25lb.

No. 60.—Donaldson Old Slope.

Inspected September 3, 1869.

Description.—I herewith submit a detailed description of the above named colliery as herein set forth. The colliery is located on the lands of the Tremont coal company, one mile north of the town of Tremont, and on the northern limits of the town of Donaldson, and 16 miles west of Pottsville. The colliery consists of 3 slopes sunk on the south slope of the Broad mountain, and approached by a branch of the Mine Hill railroad, which branch is now extended to Williams valley by the Philadelphia and Reading railroad company. The coal field here is very extensive, and every facility for transportation rendered by the Philadelphia and Reading railroad company. The New Lebanon and Pine Grove railroad connects at Tremont, also the Auburn railroad runs into Tremont, and a new railroad, now in progress from near Donaldson, running out to the Dauphin valley. The No. 1 slope is sunk 50 yards deep on the south dip of the Big vein to the water level, and 114 yards to its bottom—total depth, 164 yards. The west gangway is 1,400 yards; the east ditto is 800 yards in =2,200 yards. The coal is all mined out on this level, and the engines are used for pumping purposes. One 60 horse engine, 16 inch+6 feet cylinder; 20 feet fly wheel, 8 arms, rim 5+10 inches, 50 inch section; 8 feet pinion, and 3 feet spur wheel; 6 boilers in 2 nests, 30 inches+26 feet; grate surface, 72 feet; 1,000 feet flat chain $\frac{3}{4}$ inch; 2 tracks, 48 inch gauge; 1 pump road and a traveling road.

No. 61.—No. 2 slope is sunk 40 yards to the water level, and 157 yards to the bottom=197 yards deep on the Primrose vein; the area of the slope is 24+20+8=176 square feet; has 2 tracks 48 inch gauge; 1 pump road; a tunnel from the Primrose vein to the Black Heath vein is 30 yards; the east gangway on the Primrose is 400 yards in, and the coal faulty; the west ditto 900 yards in; east gangway on the Black Heath is 700 yards in, the west ditto 1,400 yards=2,100 yards; the tunnel is 80 yards west of the slope. The Primrose vein is 8 feet thick; the Black Heath vein is 9 feet thick=17 feet of coal. The Seven-foot vein is now working on the water level, the west gangway of which is 240 yards in. The 5 gangways are=3,640 yards long. Three veins in this slope; the thickness of coal is=24 feet; 2 50 horse engines for pumping and hoisting, (old Allegheny engines;) 650 feet+650; 1,300 feet $1\frac{3}{8}$ inch wire rope in use; 4 good boilers 80 inches+26 feet long. This slope is to be used for an upcast air shaft, and will have a 20 horse power fan erected on it, which will ventilate the whole colliery.

No. 62.—No. 3 Slope.

This slope is sunk on the Black Heath vein, south dip 51°, and has 4 lifts on it. The slope has — gangways in it; the 2 lower level gangways are in 100 yards each, and the 5 west gangways are in length as follows: first level, 1,400 yards in; second ditto, 1,400 yards; third ditto, 1.200 yards; fourth ditto, 130 yards; the fifth, 100 yards=4,430 yards. Now the 5 east gangways are as follows: first is 800 yards; second, 800 yards; third ditto, 800 yards; fourth, 130 yards; fifth ditto, 100 yards; in all=2,630 yards; total length of all the 12 gangways is=7,060 yards. The 5 gangways on the slope No. 2 equals in length 3,640 yards+80 yards tunnel, 3,720 yards, and the No. 1 slope gangways are two and=2,200 yards; the aggregate length of the 19 gangways on this colliery is=12,980 yards, or $7\frac{1}{4}$ miles nearly, but by adding the collected lengths of slopes and tunnels, thus: 3 slopes; No. 1 is 114 yards deep, 2 tracks=228 yards; No. 2 is 157 yards deep, of two tracks=314 yards, and No. 3 slope is sunk 230 yards, of two tracks, is=460 yards, which add to the lengths of the gangways, will equal $7\frac{1}{2}$ miles nearly, 2 tunnels 110 yards=$7\frac{1}{2}$ miles.

Ventilation.—A new fan is constructed and will be erected in a few days. The air at present is carried through the slope No. 3 as a downcast air-course, and an air hole from the bottom to the upper counter gangways some 75 yards up, and a furnace from this counter heading up to the Primrose level; thence, through the tunnel eastward, to the No. 1 slope to the outcast air-shaft. An air hole is commenced on the west bottom level on the Black Heath vein, and will run up to the counter level, then goes east into the Black Heath vein and into the Primrose vein to slope No. 2. The pillars are all to be holed at the top of the breasts to carry the air through them to the fan upcast shaft, and all the schutes to be substantially closed with plank batteries, with canvas on the drawholes of the working breasts. By this system there can be a sufficient ventilation of the mines effected.

Engines.—Two 50 horse pumping engines, in No. 2 slope, purchased of the Allegheny company; 650 feet $1\frac{3}{8}$ inch wire rope; four good boilers, 30 inches +26 feet. On No. 1 slope, a 60 horse hoisting engine, 16 inches+6 feet cylinder, 20 feet fly wheel, eight arms, rim 5+10 inch section; one eight feet and three feet wheels; six boilers, in two nests, 30 inches+26 feet long; grate surface, 72 square feet; 1,000 feet three plat flat chain. No. 3

slope, two 60 horse engines, 16+6 feet cylinder; six boilers, 30+30 feet; grate surface=90 square feet; two drums, 15 feet diameter, eight arms; eight inch laging; two shafts, 15 inches+16 feet; one drum 12 feet long and six feet ditto; two sheaves, 12 feet diameter; eight arms, five inch grooves; one steam gauge, carrying 80lb; machinery all in good condition; one 13 feet pinion wheel, and a five feet do., eight arms, 14 inch face; two wire ropes, one 937 and one 922 feet long=1,859 feet of $1\frac{3}{8}$ inch; 25 horse breaker engine, 15 inches+$2\frac{1}{2}$ feet cylinder; a pully fly wheel, eight arms, 12 feet diameter, 18 inch face; 102 feet gum belts; one 24 feet do.; two five feet screens, 24 feet long each; two 5+6 feet screens; two sets of rollers and four small belts; two boilers, 30 by 21 feet long; grate surface, 52 feet; capacity, 120 cars per day, and expects to ship 225 cars per day.

Remarks.—I have carefully inspected the mines and machinery, and am of the opinion that the mines are at present in a good condition, and that the drainage will be shortly in a perfect condition; so also will be the ventilation, as the preparation of both exhibits. The miners are well-behaved men, and their conduct is praiseworthy. The breasts are finished in mitre form, which supplies an additional strength to the upper gangways. There are five workable veins on the colliery; the aggregate thickness of coal, 53 feet; 560 yards outside track laid, 25lb rail, 48 inch gauge; one killed; — injured; the escape traveling roads are good.

Recapitulation.—Three visits, 64 miles; in and about the mines, 8 miles =72 miles; number of slopes, 3; number of gangways, 17; length, $7\frac{1}{2}$ miles. 22 breasts working; 662 finished breasts; eight yards pillars, run up 60 yards; five veins=53 feet thick of coal; dip, 51° south; seven engines=325 horse power; 18 boilers=492 feet long; 250 square feet area; 560 yards outside tracks, $7\frac{1}{2}$ miles inside do.=13,760 yards of T rail laid, with 1,002 yards of 40lb rail laid in the slopes=14,762 yards, or $8\frac{1}{2}$ miles, nearly; three pole pumps; 2,509 feet $1\frac{3}{8}$ inch wire ropes, and 1,000 feet of flat chain; one fan, 20 horse; one furnace; 300 men and boys employed; 20 mules; 75 wagons; three escape traveling roads; temperature outside, 60°; do. inside, 58° to 63°; no gas; three per cent. acidulated water; condition of colliery, second class; daily shipping capacity, 120 cars. Officers' names: M'Etthy, boss; Jos. Bowden, outside do.; engineers, George and Wm. Long, and James Lawler.

No. 63.—Tremont Coal Company.

Inspected September 4, 1869.

Description.—I herewith submit a detailed description of the above colliery, as herein set forth. The colliery consists of two drifts, on the Black Heath vein, two miles west of Donaldson, and 18 miles west of Pottsville, on the north of the P. & R. R. R. extension of the Donaldson and Lykens Valley railroad, on the Broad mountain. The estate is owned by the Tremont coal company; leased and operated by Adam Eitein. The colliery is new, and has a prospect in the future workings, when a slope is sunk. The dip of the veins is 70° south. The coal is a superior quality.

Gangways.—The east gangway is 300 yards in; eight breasts working on it; the breasts are 23 feet wide, 20 yards up; the pillars are 15 feet thick. The west gangway is 120 yards in on this vein; but the east gangway, on the Black Heath vein, is in 250 yards to the tunnel, and 800 yards

more to the face. The second drift is 55 yards west of the breaker, on the Big vein, and the tunnel to the Seven-feet vein is 20 yards long. The Seven-feet vein gangway is 700 yards in. Four gangways working on this colliery, are=2,270 yards; about 11 breasts working.

Ventilation.—No fan or furnace used, but ventilated by the action of the atmosphere, and this of course is no ventilation. I found no gas. The headings are only 3×4=12 square feet, which should be not less than 25 square feet, and *must be made 36 square feet* in future.

Engines.—One 20 horse breaker engine used to prepare coal; 2 boilers, 30 inches+26 feet, 12 inch+2½ feet cylinder; 4½×6=26 feet grate surface.

Remarks.—These drifts are some 70 feet above the water level; there are three workable veins open; the Big vein 16 feet thick; the Black Heath vein 8 feet thick, and the Seven-feet vein 7 feet thick, in all, 31 feet of coal; the operator is robing out all these drifts and permitting the gangways to fall in. I asked for a map of the mines to file in the office; none killed or injured.

Recapitulation.—One visit 36 miles in, and of mines 2½ miles=38½ miles; 2 drifts; number of gangways, 5; tunnels, 2; total length of tracks inside, 2,866 yards; ditto outside, 560 yards; aggregate length of T rail tracks, 560; ditto, tram road, 2,866 yards; in all, 3,426 yards=2 miles nearly; 8 breasts working, 10 yards wide, 20 yards pillars, 5 yards thick; 3 veins, 31 feet thick; 56 employees; 7 mules; 22 wagons; temperature outside, 60°; inside ditto, 62°; condition smoky and wet; capacity, 12 cars per day. Officers' names: Berthram Trefsker, boss miner; outside ditto, Geo. Horton.

No. 64.—Swatara Coal Company's Slope.

Inspected September 6, 1869.

Description.—I herewith submit a detailed description of this colliery, as herein set forth. This colliery is located on the lands of the Swatara coal company, leased and operated by Messrs. Nutting, Lewis & Co., 2½ miles west of the town of Donaldson, and 18½ miles west of Pottsville; it is situate on the north side of the Mine Hill railroad extension of the Lykens Valley railroad; the slope is sunk on the Big vein, 107 yards deep; south dip 25°; area section 24+22+8 feet=184 square feet; two tracks, 48 inches gauge; one pump road and a pump and traveling road; the west gangway is 825 yards in; there are two gangways on this level=1,660 yds.; the counter gangway is 127 yards in, on the Seven-feet vein, and in fault at both ends; there are no indications of gas in the top bench of the Big vein. I visited and inspected these mines again on the 12th September; the vein is split, and the two west gangways are on the top and bottom benches of the vein, with a partition slate dividing them, six yards thick; this partition slate is holed through at convenient distances from gangway to gangway to admit air, and used as air-courses; there is a tunnel south to the Little vein, and one to the Seven-feet vein, of 137 yards long from the slope; there are 13 yards from the Little vein to the Mammoth vein, and 12 yards from the latter to the Seven-feet vein; the thickness of coal in the four veins is=35 feet; there are three more veins close to these; the company is putting up a ventilating fan.

Gangways.—The top gangway is 850 yards; in the bottom ditto, 810=1,660 yards; 8 breasts working on the top ditto; the west gangway is closed in at the face by a crush of coal.

Ventilation.—The company is erecting a fan; the mines at present are ventilated by air-holes: the cross-cut air-holes between the two half veins are 58 yards apart, and an air-hole from the face of the gangway on the bottom bench of the Big vein, 72 yards up of an area of 5×5=25 square feet. and runs up 15 yards on the pitch; the air is brought in the traveling road on the Little vein, and an air-hole on bottom bench of the Big vein, independent of the top bench air-hole, and all brought into a breast, and thence to the outcast air-hole; there is a new air-hole making for an outcast air-hole; when completed, and the fan in operation, will effectually ventilate the mines satisfactorily.

Engines.—One 120 horse slope engine, 25 inches+6 feet cylinder, carrying 60lbs steam; 16 feet wheel, 8 arms, rim, 6+10 inches section; one drum. 10 feet+12 feet; 4 spiders, 8 arms. 11 inches baging; 9 fe t pump wheel, 8 arms, 14 inches face; shaft, 15 inches+16 feet long, and one ditto, 12 inches+22 feet, cam motion; 800 feet $1\frac{3}{4}$ inch wire rope in use; 4 boilers, 36+34 feet=136; a 20 horse breaker engine, 11 inches+3 feet cylinder; 8 feet pulley, 8 arms, 20 inch rim; 7 inch shaft, 6 feet long; 12 inches+83 feet belt; rods, 2 inches diameter; 3 boilers, 30 inches+20 feet=60 feet long, runs at 70lbs steam; the colliery first run in March last; 2 engines=140 horse; 7 boilers=196 feet long; the engines and boilers all new and in good condition.

Remarks.—The slope was put in operation in March last. It is sunk on the south dip of the Big or Mammoth vein, and dip 25°. They are driving an escape traveling road out to the surface for miners and mules. There are 3 shifts on this job, and I found but little indications of any gas. After the new fan is in operation no doubt but the colliery will be well ventilated, as there is no effort spared to make it satisfactory to all. I am pleased to say there was none killed or injured for the year.

Recapitulation.—Distance to and back, 37 miles; 2 visits; traveled inside and out, 2 miles=75 miles; one slope 107 yards deep; south dip 25°; 2 gangways 1,660 yards; outside track 1,100 yards; total length of T rails laid, including the slope, is=2,867 yards, over $1\frac{1}{2}$ miles; 8 breasts working, 10 yards wide, 60 yards long; 5 yards pillars; number of veins, 4; thickness of coal, 35 feet; 2 engines 140 horse power; 7 boilers 196 feet long; grate surface, 92 square feet; pumps—one pole pump; 800 feet $1\frac{3}{4}$ inch wire rope in use; one fan erecting; 260 men and boys employed; 12 mules and 12 wagons on hand; 2 escape roads; temperature outside, 62°; ditto inside, 60° to 62°; volume of air $2\frac{3}{4}$ times too slow; little water or gas; some black-damp; condition of mines, good; daily shipment=65 cars per day. Officers' names: D. J. Lewis, boss miner; engineer, Augustus Spitzer.

No. 65.—Brookside Slope.

Williams Valley, September 7, 1869.

Description.—I herewith submit a detailed description of the above named colliery as herein described. This colliery is located on lands owned by Messrs. Monson & Williams, of the city of Utica, New York State; leased and operated by Messrs. Savage and Kauffman. The slope is sunk on the north dip of the Lykens Valley vein, 2 miles east of Williamstown, and 26 miles west of Pottsville, 11 miles west of Tremont. It is situated on the line of the new railroad, a branch of the Philadelphia and Reading railroad to Williamstown, and $\frac{1}{4}$ mile east of the boundary line of the

county of Schuylkill. The slope is 700 feet above the level of the creek and 150 yards deep. The splendid view afforded by this beautiful valley, and as well of Peters valley, from the slope house is quite delightful, and some persons, not acquainted with our mountain regions, would not suppose that such charming scenery as it exists here. The view contrasts mainly with that afforded from Avondale to Scranton, excepting the beautiful Susquehanna river, filling the spectator with admiration. The colliery is recently put in operation, and the appearance of things reflects credit on Messrs. Savage & Kauffman. The Wiconisco creek traverses the valley below on its course westward to the Susquehanna river, passing, in its course, several towns in the valley. The passenger trains of the Philadelphia and Reading railroad company arrive and leave daily at the colliery, and afford great convenience to the inhabitants of the valley.

Gangways.—The east gangway is in 87 yards, with 2 breasts open on it. The west gangway is 57 yards in, opened yet.

Ventilation.—A steam fan is contemplated to be used soon. No manner of ventilation as yet.

Engines.—Two 60 horse steam pumps used in the slope, and one 50 horse used at the breaker; 600 feet of flat chain is used; a 4 horse feed pump, 6 inch+3 feet cylinder, used at the boilers; 2 sixty horse hoisting engines for slope use; rods $2\frac{1}{2}$ inches diameter; link motion; 18 inch+4 feet cylinder; 9 inch shaft, 15 feet long, and 2 chain drums; 4 good boilers in 2 nests, 34 inches+30 feet long, running at 95lbs steam; 2 safety valves; 2 gauges on each boiler; grate surface, $4\frac{1}{2}+12=54$ square feet.

Remarks.—After diligent inspection of the mines and machinery, I find them in proper condition. I recommended some additional changes made favorable to the fan ventilation, as I deemed it necessary.

Recapitulation.—Distance to and back, 26 miles; in and about the mines, 2 miles=54 miles; one visit=54 miles; one slope 150 yards deep; north dip 50° to 60°; 2 gangways, in length 144 yards long; area of section 65 square feet; 2 breasts open, 10 yards wide, 60 yards long; 6 yards pillars; one vein; thickness of coal, 12 feet; 4 engines 320 horse power; 4 boilers 120 feet long, 95lbs steam; grate area, 62 square feet; 400 yards outside tracks; 2 sixty horse steam pumps; 600 yards of flat chains; no fan or furnace yet; 100 men and boys; one escape road by a tunnel drove 30 yards east of the slope bottom, on a level, out to the surface and side of the mountain, which will serve for draining and traveling; temperature outside, 62°; ditto inside, 64°; condition of air, 9 times too slow; no gas but quite damp; shipping capacity, 60 cars.

No. 66.—Tower Slope.

Inspected September 8, 1869.

Description.—I herewith submit a detailed description of this colliery as herein set forth. This is a new one, located at Tower City, in Williams valley, 2 miles east of Brookside colliery, and 24 miles west of Pottsville, situated on the same line of railroad with the last named colliery, having a full prospect of Williams and Paul valleys, and 2 miles west of the entrance thereto. The colliery is some 650 feet higher than the level of the Wiconisco creek. The slope is sunk on the north dip of the Lykens Valley vein, 85 yards deep, the dip 56°. The passenger train stops twice daily at the works. This is a new coal field, and promises well. Enter-

prise and capital is the only thing now needed to develop this new coal field and open it to market, as the quality is excellent and the quantity enormous, and the region extensive, reaching to the Susquehanna at Dauphin, to Trevorton and Shamokin.

Gangways.—Slope has 2 tracks, 48 inch; one pump; ditto slope, 85 yards deep; section area, 22+19+12=246 square feet; east gangway is 10 yards in; the west ditto 15 yards in=25 yards.

Ventilation.—An air hole at present, but the firm is getting up a steam fan of 10 horse power. The air hole is driving on the west gangway, of an area of 5+7=35 square feet. This is quite sufficient, but the fan outcast shaft will be 60 square feet, as near the area of both the west and east air holes; the headings in the pillars of an area of 35 square feet, and the pillars all holed at the top of each breast when finished.

Engines.—A 25 horse engine at the breaker; 12 feet wheel, six arms. 5+8 rim; two five feet pulleys, and two 60 feet gum belts=120 feet long, receiving steam from the slope boilers; 220 yards of flat chain.

Remarks.—The colliery is quite recently put in operation, and from appearances then an opinion cannot be vetured on, but the prospects are flattering. The operators, Messrs. Savage & Althouse, are good miners and enterprising men, and do all in their power to secure to the miners safe means of working and retreat roads, as they have a good road in the slope, and contemplate establishing a better one soon.

Recapitulation.—Slope, north dip, 56°; area section, 22+19+12=246 square feet; east gangway, 10 yards; west do., 15 yards=25 yards; no breasts; four engines=115 horse power; four boilers=120 feet long; 220 yards flat chain; grate surface, 52 square feet; 56 employees; no mules; four wagons; 60 yards outside track, 25 do. inside, 170 yards slope tracks=645 feet T rail, of 25lb, and a 48 inch gauge; shipping 10 cars per day at present, but soon 60 cars per day; one pump; no fan or furnace; one escape road; temperature outside, 63°; do. inside, 62°; condition of mines good.

No. 67.—Rauch Creek Slopes.

September 9, 1869.

Description—This colliery consists of two slopees, located on the estate of George B. De Keim, situated 2½ miles west of town of Tremont, and some 18 miles west of Pottsville, six miles north of Pinegrove town, at the extreme end of the Mount Eagle railroad, which is a branch of the Mine hill railroad. The colliery is leased and operated by Henry Heil, Esq., of Tremont. The land is an excellent coal estate. Mr. William Ellett manages the colliery, and, owing to his practical knowledge of mining, the mine cannot fail to be a productive one, and every necessary measure taken to make it safe for the miners to work in. Slope No. 1 is sunk on the north dip of the Big vein, 230 yards deep; section area 16+13½+8=118 square feet. This slope has a 60 horse steam pump in it, located at the bottom, and double acting; a 10 horse feed pump, and 1,700 feet of 1¼ inch wire rope. No. 2 slope is 120 yards deep; section area 26+18+8=176 square feet; two tracks, of 48 inch gauge, in each slope; 16 inches+6 feet cylinders; 460 yards flat chain. The slope is sunk on the Black Heath vein. Engines of No. 2 slope are two 40 horse power, 16 inches+5 feet cylinders; a 15 and a 16 feet fly wheel, eight arms each, one rim, 6×12=72 square

inches, and a 5+9 square inch; one 8+12 feet drum; two six feet pinion wheels, eight arms, and a 12 inch face; two shafts, 12 inches+16 feet long; one pinion, 3 feet; six arms, 13 inch face; rods, three inches diameter; 150 yards $\frac{7}{8}$ inch chain used on the incline plane, at the breaker; 12 boilers, in six nests, in two boiler houses, and all connected, six of which are 36 inches+30 feet long long, and 32 inches+30 feet; one 25 horse breaker engine, eight feet wheel, eight arms, 18 inch rim; 6 inches+10 feet shaft; 250 yards gum beltings used; 120 horse pumping engine, and 140 do. 18 inches+8 feet cylinders, attached to the hoisting engine. All the machinary and engines, boilers, etc., are in good condition, and managed by competent engineers.

Gangways.—The whole length of gangways in these mines, working and worked, consist as follows: A water level drift 800 yards, a plane 60 yards, and a level of 200 yards at top of this plane. The old east counter gangway is 1,000 yards in. The Big vein east do. is 1,700 yards in and 800 yards branches. The old east gangway on Black Heath vein is 1,000 yards in. The tunnel is 200 yards, and a north do. 100 yards. The west Black Heath gangway is 1,000 yards in, and the east gangway 1,200 yards in, and south tunnel 70 yards. A tunnel to the Ten-feet vein is 70 yards, and a west gangway 300 yards. The middle level east gangway, is 2,980 yards. The length of tramroads in breasts=410 yards. Twelve gangways=11,390 yards; four tunnels, 440 yards; one plane, 60 yards; two slopes, 350 yards; two tracks in each, equals 700 yards; aggregate length of tracks in the mines=12,590 yards; outside tracks=2,560 yards; to this measure add 700 yards of old drifts, which equals 15,850 yards openings, of lineal measure, of tracks, which is equal to nine miles; 10 yards of 25lb rail, equals 351 tons and a fourth, at $80 per ton=$28,100.

Ventilation.—The ventilation is effected by an upcast air-course, driven each side of No. 2 slope, and communicating at the stack of the boiler house; this plan is very successful, as the great draft from the twelve boilers up the stack, assists the draft in the mines; besides, there are two air-holes, assisting the far off works; there is a perfect heading course running through all the breasts, and made to communicate with the slack air shaft by closed schutes and check doors arranged in such needful places; they use a furnace on the lower east gangway of the Big vein, and draws out in the old counter ditto to the surface; the second furnace is only $2\frac{1}{2}+2\frac{1}{2}=6\frac{1}{4}$ square feet square; this is too small an area.

Engines.—A 60 horse pumping and hoisting engine in No. 1 slope, and a 10 horse feed pump; one 140 horse pump in the No. 2 slope, and a 120 horse ditto in the No. 1 slope; 240 horse engine as hoisting engine in No. 2 slope, and a 25 horse breaker engine; 7 engines=435 horse power; 15 boilers=435 feet long; all of these engines and boilers are in fine condition and carefully kept by the engineers.

Remarks.—The two slopes are 10 yards apart, and on the north pitches of the Big vein; a partition slate six yards thick, separates the twin veins, and dip 33°; there are four veins: the Big vein in two parts, each 10 and 12 feet thick; the Black Heath, 8 feet, and the Seven-feet vein, equal to 37 feet of coal; there is an air-hole in the west gangway of the bottom bench of the Big vein, 900 yards from the slope; all others are closed; here an upcast and mule road is made 50 yards from the slope, going north to the Big vein; from this I found no regular air-hole out to the surface, but the air pass through some filled and fallen stuff; an air-hole is in at the face of the west gangway, into the old level, thence to the water level tunnel on the Big vein; this is used as an air upcast. I recommended a door to be used inside the air-hole on the Black Heath vein gangway, to force the air

to the face of the work; all batteries made of plank; nothing else is permanent; the inside hole is 20 yards from the face, and only 4 square feet; it should be 16 square feet, and should be run out to the surface; the breasts run up from 90 to 100 yards, and are 9 to 10 yards wide; the pillars 8 yards ditto; all air-holes west of this tunnel should be shut off, and the air brought to the stacks of the engines, and use these stacks as upcast air shaft; the air on the lower level draws out in the old counter level; I recommended an air-hole to be drove to the main upcast air-hole; the air splits here at a door, and goes west along the face, and returns through the breasts to the upcast; I found considerable gas in these gangways in the lower level, and put out all the common lamps; I directed that no lamps but the safety lamps should be used, and desired Mr. Ellett to see these instructions carried out, for there is great danger to life in using any lamps but good safety lamps in the hands of careful miners; the gas stood 30 feet from the corner of the stump pillar in the breast; I forbid any person ride on loaded wagons, and not more than eight persons at a time to ride in empty wagons.

Recapitulation.—The colliery consists of two slopes, 120 and 230=350 yards deep; 12 gangways, 11,390 yards long; 4 tunnels, 440 yards; one plane, 60 yards; other gangway, 1,200 yards; 2,560 yards outside tracks; double depth of slope, 700 yards; aggregate lengths in yards=15,850 =9 miles; number of visits one; distance to and back, 36 miles; in the mines, 6 miles=42 miles; 37 breasts, working 10 yards wide, 100 to 90 yards long; 6 yards pillars; 4 veins coal, 37 feet thick; 33° dip; 7 engines =435 horse power; 15 boilers=435 feet long; 780 yards flat chain; 1,820 yards wire rope in use; 3 pumps in use=320 horse power; 3 furnaces; no fans; 3 good escape roads; 159 men and boys employed; 21 mules; 79 wagons; temperature outside, 68°; ditto inside, averaging 60°; volume of air, 5½ times too slow; 26 per cent. of gas where found; 80 ditto mineral salt in the water; condition of the mines fair; shipping capacity, 50 cars per day; can ship 110 cars ditto. Officers: boss miners, William Ellett; outside ditto, Edward Neil; first engineer, Edward Miller; second ditto, James Saylor; third ditto, Mr. Nagle.

No. 68.—Lower Rauch Creek Slopes.

September 10, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. This colliery is located on the same railroad, on the estate of George B. DeKeim, one mile south of the Henry Heil colliery, 2½ miles west of Tremont, and 18½ miles west of Pottsville, 5 miles north of Pinegrove, and one mile east of Lorberry collieries. The colliery is leased and operated by Miller, Graff & Co., of Pinegrove. It consists of 2 distinct slopes and two ditto breakers—one colliery each side of the creek. The old slope is situated on the east side, and some 14 years in operation. The new slope is just sunk and in operation. At this part of the coal field the mountain ranges change their courses. The Sharp mountain is broken by the Rauch Creek gap and re-forms into several high knobs, each changing its position, and finally re-forms into the Bear Gap mountain, the Biglick and Sharp mountain, and in consequence of this great disturbed configuration of the earth, the veins change very singulary. The Big vein, west of Rauch creek, changes as follows: First, from west to south; then ½ east; then ½ south to west, to ½ north, to west, to south,

to ½ west, to ½ north and to west, dividing as they approach the Williams valley, the western branch dipping north forming a new basin and the other branch forming a southern basin with a south dip of 51° at Paul's Valley mountain, and a corresponding dip of 51° north on that section of the Broad mountain which gives rise to Lykens mountain, near the boundary line of Dauphin county, and as it approaches the Lykens valley the vein inclines to a dip of 8°, and finally settles down to a level. As the vein approaches this flat it gets much thicker and purer and less foreign matter, the coal increases to a thickness of 60 feet. The south-west branch runs along the north slope of the 4th mountain, dipping south along Paul's and Clark's valley. Mr. Shaffer is tunneling for this vein on the South or 3 mountain at Williams valley, opposite to Savage & Althouse's colliery, and from information, the prospects are very encouraging.

This colliery is managed by Mr. Edward B. Moore, who is a good practical miner, and has done much in the line of strengthening the present mines and recovering the abandoned coal, and perfecting the drainage, and bringing the colliery back to its former standing.

No. 69.—No. 1 slope is 267 yards deep, of an area of 24+21+8=180 square feet, of two lifts. The air shaft is 10 yards west of the slope, and drove in the slope pillar. The 2 gangways are just turned at its bottom. The east is 140, and the west 120, yards in; the coal from 10 to 20 feet thick, and dip, 22° south; section area of these gangways is 67 square feet; 7 breasts open on the east, and 8 ditto on the west, each 10 yards wide; the pillars 6 yards thick. The slope is used for a traveling road for mules, and a stepped traveling road for men one side; 600 yards of 1¼ inch wire rope is used.

No. 2 slope 140 yards deep; area, 22+20+8=168 square feet, and dip, 25°; 2 tracks 48 inch gauge; a pump and traveling road. The west gangway on the lower level of this slope passes under the east gangway of the old level of the new slope, and 800 yards from the bottom of the old slope it splits off, with a partition slate 6 feet thick between them, for 1,200 yards, and again unites and going west for 400 yards more, then suddenly turns south and to south-east the line of the Lorberry tract 300 yards off, and this gangway runs 60 yards under the Lorberry slope, and by holeing it to the slope all the water of that colliery could be pumped out by the pumps of slope No. 2. The area of this gangway is 60 square feet. The east gangway on the Lorberry slope runs 800 yards. There are headings through all the pillars into all the breasts, and all the air-courses good.

Gangways.—The two gangways on the new slope are 260 yards in; the old gangway is 2,860 yards in; the old gangway on the bottom slope, is 2,000 yards in; and the splice gangway is 1,200 yards in; in all, 4 gangways is=6,320 yards in; the 2 slope double track, 814 yards=6,134 yards.

Ventilation.—A steam fan, 20 horse power ventilates these mines; the main fan upcast air shaft is 46 square feet section, and 14 feet fan; this shaft is of uniform area to the bottom of the slope; I found the gas so high as 16 per cent. in the face of the old gangway; I at once put out all lamps, except the safety lamps, and gave positive instructions none else should be used at that dangerous locality, as the evolution of gas was constant, and in a large proportion to the other air; this situation requires the most careful attention to evade an explosion, and no person but a practical and prudent miner should be permitted to work in this part of the mine; I examined all the other air-courses in the mines and the check doors, and find them in

most instances correct; now since the substitution of the steam fan, these air-courses must be changed, so as to communicate with the fan outcast air-course, and thereby the ventilation will be greatly improved.

Engines.—Slope No. 1, has one 60 horse engine, 16 inches+5½ feet cylinder; a 16 feet wheel, 8 arms, rim 5×9 inches=45 inches section; an 8 feet +12 feet drum; shaft 10 inches+8 feet long, and one 10 inches+15 feet long, and one 12 inches+16 feet ditto; a 20 horse fan engine, 14 feet paddles, 4×4=16 square feet=96 square feet section, with an 8 feet power pulley, runs at 100 revolutions; 4 inches+12 feet shaft; the engine works 2 pole pumps, each 6 feet stroke; this engine is used at present for pumping, and a two 40 horse engine is to be used to hoist the coal; 8 boilers, 4 new and 4 old, 34 inches+36 feet long; grate surface, 110 square feet; 3 valves in good order; an 18 feet wheel, 8 arms, rim 6+12 inches section; one shaft, 12 inches+10 feet long; a 12 feet+12 feet drum, its shaft 12 inches+14 feet; pinion wheel, 12 feet, 8 arms and 12 inches face; 20 inch spur wheel and a 5 feet pinion ditto on same shaft; a pump wheel 9 feet diameter, 8 arms, 15 inches face; the pumps are double acting, 14 inches+6 feet cylinders. Breaker No. 1, a 30 horse engine, 14 inches+3 feet cylinder; 12 feet wheel, 6 arms, 5+7 rim; 8 inches+8 feet shaft; 6 feet belt pulley, 8 arms, 20 inch face; 14 inches+50 feet gum belt; a 5 inch+12 feet shaft, and one 5 inches+5 feet ditto; a cone gearing; a drum 5 feet+6 feet, with 120 yards of ⅞ inch chain; 10 other belts, 300 feet long; two 4+22 feet screens; 4 ditto, 4+5 feet ditto; 3 boilers, 30+28 feet; 50 yards incline plane at breaker; 48 inch tracks=100 yards. No. 2 breaker has a 30 horse engine, 12 inches+2½ cylinder; 14 feet wheel, 6 arms, 5+7 inches rim; a 14 inch pulley, with 12 inches+150 feet belts; 2 screens, 5+22 feet; 5 ditto, 4+6 feet; 3 boilers, 30+30 feet=90 feet; grate 4½×9 feet=40½ square feet.

Remarks.—I have carefully examined all the mines, gangways, air-courses and pillars, and find the work done by Mr. Moore, to be in a proper way, and gave such instructions as to ventilate systematically. I believe he will carry out. The fan outlet is a little too narrow, but an increase in its running will overcome this defect; all the safety lamps must be cleaned daily, and carefully examined before using them: lighted safety lamps must be suspended in the fiery breasts and gangways, to warn the miners of danger from that element, and a close adherence to these rules will result in a benefit to all those who labor in the mine.

Recapitulation.—The colliery consists of two slopes. No. 1 slope is 267 yards deep; section area, 24+21+8=180 square feet; No. 2 is 150 yards deep; south dip, 22°; section area, 22+20+8=168 square feet, each having two tracks, 48 inch gauge, and two pump roads and two escape traveling roads; six engines=220 horse power; 14 boilers=462 feet long; 1,200 feet of 1⅓ wire rope; 120 feet ⅞ inch chain; 600 feet gum belts; two coal breakers; shipments daily, 150 cars per day; number of visits, 2; distance to and fro, 37 miles; inside and out, four miles=41 miles; length of five gangways, 5,320 yards; double the length of the slopes=814 yards=total length of track in the mines is 6,134 yards; 6,700 yards outside tracks; aggregate length of T rail tracks=12,834 yards=7 $\frac{3}{10}$ miles; two pumps; one fan, 20 horse, 14 feet diameter; 246 employees; 61 mules; 146 wagons; two traveling roads, temperature outside, 70°; do. inside, 46°, 52° and 66°; difference, 34°; condition of air, 6¼ times too slow, but then the fan was not quite completed; percentage of gas, 16 in the old gangway; eight per cent. acidulated water. Officers: Edw. B. Moore, boss miner; first engineer, Andrew Faust; second do., Daniel Boe, Percival Wein. The slope man is the last to come up in the evening. Killed, none; injured. Westley Hand and Jacob Weildy—not severely.

No. 70.—Mammoth Vein Slope.

September 13 and 14, 1869.

Description.—I herewith submit a detailed description of the above-named colliery, as herein set forth. The colliery consists of a new slope, sunk on the north dip of the Mammoth vein, on the estate of Mr. Smælly, four miles west of Tremont, and 20 miles west of Pottsville. It is located on a flat of the Broad mountain; approached by a branch road of the P. & R. R. R., running to Williams valley. It is 44 miles from Pottsville, by the Auburn and Tremont railroad. The slope is 140 yards deep; section area, 24+22+6=138 square feet; has two tracks and a pump and traveling road; it dips north 80°. The Mammoth vein is split by a six yards thick of a partition slate, and runs parallel east and west; an incline plane extends from the slope to the top of the breaker, 200 feet long, and has an elevation of 99 feet. The coal is hauled up from the mines to the top of the breaker; the wagons unloaded and returned to the mine again. This slope is very unsafe for men to ride up or down in, as the slope rope cuts the collars in several places, and in doing so may subject the roof to fall in. There is a step-ladder in the east side to travel by, but it is very laborious to do so. I have recommended the driving of an incline traveling road, for men and mules, on the east side, in a switch-back plan, which would suit the purpose. The partition slate is holed in many places from vein to vein, and the air is carried in in this manner in the ganyways, and thence pass up into the breasts and through the headings, to an upcast furnace shaft in the west of the slope. There is a counter west gangway now working, and a number of the lower level breasts are run up into this gangway, and holed through the track, where the laborers unload the coal into them. There are nine such holes in this counter gangway, and some of the holes are only temporarily slabbed over. The depth of these holes is 55 yards, or 165 feet, at an angle of 80°. I found this location in a fearful condition, for want of secure hatches on the holes, or side schutes made with slide gates, which would protect the men in this fearful situation. September 9th, William Kavanagh was precipitated down the slope and killed instantly; and on the 13th of September, 1869, Patrick Coyne fell down one of these counter schutes, the distance of 165 feet, and was killed outright. I descended the slope, in company with William O'Neill, boss miner, Benjamin Charlesworth and John Foley, on behalf of deceased, and my assistant, Mr. M'Andrew. I carefully inspected the different localities, and heard the statements of witnesses, and consider the place was unsafe for a man to work in, and am of the same opinion as was rendered by the verdict of the jury in the cases. I then recommended such security as seemed to me necessary for the protection of the lives of the employed and the safe ventilation of the mines, and requested *Charlesworth* and *Foley* to report any dereliction or delay in securing these dangerous places.

Gangways.—The west gangway on the lower level is 470 yards long; the east ditto, 100 yards ditto; the west ditto, on the upper level is in 400 yards, and the east ditto, 100 yards; the west counter gangway is in 400 yards=1,470 yards; the Big vein is in two benches—the Seven-feet vein and South veins; there is not much work done, and the place full of powder smoke.

Engines.—One 60 horse hoisting engine, 18 inches+6 feet cylinder, rods $3\frac{1}{2}$ inches diameter; 18 feet wheel, 8 arms, rim 7+10 inches=70 inches section; one 10 feet pinion wheel, 8 arms; 22 inch spur, ditto; 14 inch fan; 12+11 feet shaft, no hern on the drum; 400 yards $1\frac{3}{8}$ inch wire rope; a 35 horse breaker engine, rods $2\frac{1}{2}$ inches diameter, 12 feet wheel, 8 arms, rim

5+7 inches, used as a pulley, with a 30 inch rim; belt shaft 6¼ inches+6 feet; 16 inches+100 feet gum belt; 6 boilers in 2 nests, 30 inches+30 feet=180 feet; 100lbs steam; should not be above 90lbs; slope pump 8 inch column and an 8 inch+8 feet stroke.

Remarks.—I found the mines and management in an unsatisfactory condition; no escape road, if the slope should close, and no traveling road from the lower levels to the counter levels, but ascend by the slope and signal by calling; no bell or bell wire used; no fan or regular furnace. I made two visits, and gave the requisite instructions to the boss and miners of what should be done. I communicated with the operator, J. H. Osterman; he failed to appear. I found too much smoke in the mines, and tendency of negligence pervading the whole management of the colliery—a fact too true.

Recapitulation.—1 slope 140 yards deep; 4 gangways, 1,470 yards long; 500 yards outside tracks=1,970 yards; 4 veins=35 feet thick; 2 visits by railroad, 176 miles; in and about the mines, 3=179 miles; 2 engines=95 horse; 6 boilers 180 feet long; one pump, 8 feet stroke; 400 yards of 1⅜ wire ropes; no fan; one temporary furnace; force, 66 men and boys employed; 6 mules and 13 wagons in use. I asked a transcript map of the mines; temperature outside, 76°; inside, 48° to 58°; difference 28°; condition of air, 13⅓ times too slow and smoky; daily shipments, 12 cars. Officers: William O'Neil, boss miner; first engineer, Joseph Zeff or Zepff.

No. 71.—Potts' Slope.

Wolf Creek, September 16, 1869.

Description.—I inspected this colliery, and herewith submit a detailed description as herein set forth. The colliery is located at Wolf creek, on the confines of the borough of Minersville, and 5 miles north-west of Pottsville, on the south slope of the Mine Hill. This is one of the oldest and most productive mines in the State, being over 36 years in existence, incessantly producing a large yield of coal. This colliery has the reputation of being the first one in the Union that had the Batten rollers in operation. At the time Mr. Gideon Bast worked these mines, he was the first operater that used steam power and the new plan of rollers to prepare marketable coal. The slope is sunk on the estate of John P. Brock, of Philadelphia, and Mr. Cummings, attorney-at-law, of Pottsville, now leased and operated by the Diamond coal company, Col. A. B. Gorgas, agent. The slope is sunk on the south dip of the Rees Davis vein, 481 yards deep, 33° dip, section 24+20+8=176 square feet, has 2 tracks, 44 inch gauge, 25lb. rail; it is sunk five lifts; a tunnel drove to the south vein. The east gangway is in 800 yards; the west ditto, 1,000 yards; 100 yards east of the slope on the lower level the first door, and inside of it the air comes from the South vein into the Rees Davis vein; air heavy and full of gas; both black and fire-damps. The cross-cut is 17 yards from vein to vein, and the first door on the Rees Davis vein is 150 yards further in. This gangway is 800 yards in and has 800 yards to the line of the tract. All the breasts are 10 yards wide and 80 yards long; the pillars are 6 yards thick. There are 118 yards from the lower level to the next counter level. The pillars are all headed at the top of the breasts so as to ventilate the breasts and establish a circulation of air through the works. The air is forced through the breasts and returns by the top headings to the upper counter level; thence

to the outcast air-course to the fan. The air-hole on this gangway is 300 yards from the fan. There are 19 breasts working on the Rees Davis vein, and 17 breasts working on the South vein. The mines are worked skillfully by Mr. Baddow, but owing to the heavy air and the amount of gas evolving, it is necessary to change and shorten its present course, so that the fan may operate to better advantage. The slope being the downcast, the air passes in west and airs that part of the mines; returns through a tunnel to the South vein, and airs the west of that vein; goes east to the fan, and comes north to a cross-cut drove on the east gangway of the Rees Davis vein; goes west, returning through the breast, and thence to the upcast at the fan. Yet all this cannot relieve the condition of the air, as the distance is too great and the air heavy.

Gangways.—The first gangway on the first level is 500 yards; the east ditto, 500 yards; the west ditto on the second level is 1,100 yards; the east ditto, 900 yards; the west ditto on the third level is 1,100 yards; the east ditto, 900 yards; the west ditto on the fourth level is 1,100 yards; the east ditto, 1,700 yards; the west ditto on the fifth level is 800 yards; the east ditto, 800 yards=9,400 yards.

South Vein Gangways.—First gangway west is 500 yards; the east gangway is in 500 yards; the west ditto on the second level is 500 yards; the east ditto is 512 yards; the west ditto on the third level is 700 yards; the east ditto is 512 yards; the west ditto on the fourth level is 700 yards; the east ditto is 512 yards; the west ditto on the fifth level is 800 yards; the east ditto is 800 yards; the total length of the gangway on the Rees Davis vein is 9,400 yards, and the length of gangways on the South veins =6,036 yards=15,436 yards; to this measure add 200 yards of tunnels and 481 yards of slope, which doubled=962 yards, the aggregate length of tracks, by including 600 yards of turnouts, will equal $9\frac{1}{2}$ miles; some 1,600 yards of outside track will exceed 10 miles.

Ventilation.—A 15 horse steam fan ventilates the mines at present, but owing to the great distance the air has to traverse, carry with it all impurities and making allowances for leakage, the fan cannot be expected to clear the mines properly; the column must be shortened by closing up some places and opening nearer air-courses. The section area of the fan outcast is 36 square feet. This is one-half too small an aperture for such a body of air to pass; it only tends to contract it, and therefore diminish its volume. This should not be the case, as the section area of the fan outcast should exceed the section area of the two means, and the section area of any of the means should equal the area of all the inferior headings, on the same principle as the operation of the lungs do.

Engines.—The engines in use at this colliery are one 15 horse fan engine, 11 feet paddles, $10\frac{1}{2}$ square feet each+8=84 square feet at 100 revolves; 2 boilers 30+30 feet=60 feet; grate, 25 feet square; one 90 horse for slope, 20 inch+6 feet cylinder, 4 inch rods, 18 feet wheel, 8 arms, rim 5+10=50 square inches; drum 9+12 feet; 5 spiders, 8 arms, 12 inch planks; a 5 feet pinion; 3 feet spur, 8 arms, 12 inch face; shaft 10 inches+9 feet; drum ditto, 9 inches+14 feet; 3,036 feet $1\frac{1}{4}$ inch wire rope; 8 boilers in 3 nests, 30 inches+30 feet=240 feet; 3 S valves, 65lbs steam. The boilers are in use 12 years. The water is good One 50 horse pumping engine, 16 inch+$7\frac{2}{3}$ feet cylinder; 8 boilers, 30+20 feet long, in the old slope= 160 feet long; shaft 16+16 feet; 2 pinions 9 feet diameter, and a shaft 12 inches+16 feet, all which is kept in good order; also a 40 horse breaker engine; 3 boilers 30 inches+20 feet; 4 engines=195 horse power; 21 boilers=520 feet.

Remarks.—The colliery consists of 2 slopes, the old slope 200 yards

deep, used only for pumping water. The new slope is down on its fifth lift. Having described the air-courses, and giving my opinions about the necessity of shortening the volume of air, which he promised he would remedy, the gas is very strong in the mines. I advised Mr. Baddow to cut a cross-cut in the South vein at the face of the gangway into the Rees Davis vein, which would strengthen the column of air in that part of the work; the safety lamps to be numbered and booked, and the persons' names using these lamps to be registered for that purpose; also, to appoint a proper person whose duty it is to clean and lock and keep the lamps, they to be carefully examined each morning before using them; the firemen, William Manwilling, John Manwilling and David Gray to have control of all the lamps in their departments; to examine all working places in the mines and first to report the condition of each place first before allowing any person to enter in or work in such places, and see that all was safe; that a lighted safety lamp should be kept constantly burning in each working breast and gangway, suspended at the top, so as to show at any time the true condition of the volume of gas, and that no person but experienced miners should be permitted to work in the mines when there was the slightest presence of gas, as, in such case, the slightest accident might involve the loss of all the miners and the destruction of the colliery. I found the engines and machinery in good condition, and the officers very attentive in their duties.

Recapitulation.—The colliery consists of 2 slopes; 4 engines=195 horse power; 21 boilers=520 feet; 20 gangways, 13,692 yards; outside track, 1,600 yards; 600 ditto turnouts; 962 yards slope tracks; 200 ditto of tunnels; in all over 10 miles; 36 breasts, 10 yards wide, 80 yards long; 6 yards pillars; 2 pumps; 3,036 feet wire rope; 36 breasts; a 15 horse fan engine, 11 feet diameter; 268 men and boys employed; 13 mules; 96 wagons used; escape roads, 2; temperature outside, 76°; ditto inside, 58° to 67°; condition of the air, full of gas and $3\frac{2}{3}$ times to slow; daily shipment of cars, 80 per day. Officers' names; William Beddow, boss miner; A. B. Gorgas, agent; William P. Daniels, outside boss; first engineer, Henry Parry; second ditto, John Bassett. Gas, 20 per cent.; 12 ditto acid water; one visit; 10 miles in mines; 5 ditto=15 miles; number of veins, 4; thickness of coal, 32 feet thick.

No. 72.—Kear's Slope, Wolf Crerk.

September 17, 1869.

Description.—Having inspected this colliery, I herewith submit a detailed description of these works. As the new fifth lift was just completed and no gangways turned at the time, I was confined mainly to examine the engines, boilers and machinery, as well as the location of the new fan. This colliery is located on Wolf creek, one mile north of Minersville, and five do. nort-west of Pottsville, on the estate of ———, now leased and operated by Kear, Confer & Co. It is one of the oldest collieries in the State, and was for a number of years operated by the late Richard Kear, Esq. This slope is now sunk on its fifth lift, some 504 yards deep, on the Rees Davis vein, at a dip of 33°. It is at present the deepest slope in the country. Preparations are making to erect a 20 horse fan, 14 feet paddles, on the west of the slope, and the outcast so far is fully up to the standard measure. Under the experienced management of the Messrs

Kears, no doubt but the colliery will prove a success, as they are remarkably industrious miners themselves.

Engines.—A 60 horse slope engine, 18 inches+6½ feet cylinder, rods 3½ inches, 20 feet fly wheel, eight arms, 6×10 rim=60 square inches; one six feet and one three feet pinion, eight arms, 12 inch face; 12 inches+10 feet shaft; drum 10½ feet+12 feet long; five spiders, eight arms, 12 inch planks; 12 inches+15 feet shaft; one 40 horse pumping engine, 16 inches +4½ feet cylinder, three inch rods, 16 feet wheel, eight arms, 4+9 rim; one 10 feet and one 20 inch wheel, eight arms, and 14 inches face; one shaft, 10 inches+eight feet long; 10 inch pump, six feet stroke, and two pumps in two lifts; eight boilers, in four nests, 30 inches+36 feet long=288 feet long; cleaned and examined 102 square feet grate surface; four safety valves, at 94lb steam; beam stamped; 1,050 yards of 1½ inch wire ropes in use; a 30 horse dirt-plane engine; two boilers, 30 inches+ 26 feet long=52 feet; 100 yards of plane, of two tracks=200 yards; 260 yards ⅞ inch chain; a 20 horse breaker engine, 10 inches+3 feet cylinder, 10 feet wheel, eight arms, rim 4×7=28 inches; six feet pulley, eight arms, 18 inch rim; 14 inches+30 feet belt, and 10 belts=170 feet; three boilers, 30 inches+14 feet=42 feet; one valve, carrying 70lb steam; 36 feet grate surface.

Recapitulation.—Five engines, equal to 170 horse; 13 boilers, 382 feet long; one visit, 10 miles; slope 504 yards deep; two gangways on fourth level; west 1,500 yards, east do. 200 yards=1,700 yards; the upper gangway worked out finally; three veins, 27 feet thick; outside track, 1,650 yards; total length of tracks=3,350 yards; three pumps; 1,310 yards wire ropes; one fan in course of construction; 40 men and boys employed; one mule; 30 wagons; one escape road; condition of things, good and well cleaned; shipping capacity, 10 cars per day. Officers' names: Samuel Confer, outside boss; first engineer, William Levins; second do., Peter Souper; third do., Wellington Schultz. Temperature outside, 74°; do. inside, 49°; difference, 25°.

No. 73.—Mine Hill Gap Slope.

September 18, 1869.

Description.—I have visited the above colliery, and herewith submit a detailed statement of the same. The colliery is located on the west side of the Mine Hill gap, and the slope is sunk on the south of the Mine hill, on south dip of the Big vein, within 1½ mile north of Minersville, and 5½ miles north-west of Pottsville; approached by the Mine Hill railroad; and the situation is one of the most favorable in the region. This colliery is also one of the very oldest in the State, and has been successfully operated by Charles and William Hill for a number of years. Of late it has come into the hands of Messrs Barker & Co., of Scranton, Pa., who, after a short trial, dismantled the premises and abandoned the colliery for the present. The tenant, or miners', houses on the premises are in good condition, and under Mr. Barker's admidistration, who put the slope in excellent condition, and, for reasons best known to himself, he suspended operation, and suffered the slope to fill with water, and finally closed the colliery.

No. 74.—West Mount Laffy Slope.

September 18, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. The colliery is located on the eastern side of the Mine Hill gap, quite near the Mine Hill railroad, and on the southern slope of the Mine Hill ridge, on the estate of Joseph Patterson, of Philadelphia, one and one-half miles north of Minersville, and five and one-half miles north-west of Pottsville, and within a few yards of the Mine Hill and Ashland railroad. The location is desirable and the present slope is now sunk on the second lift to the depth of 320 yards; the new lift is 125 yards deep on the south dip of the Big vein, at an angle of $16\frac{1}{2}^{\circ}$; the colliery has very favorable shipping advantages, being near the shipping docks at Schuylkill Haven, and also the car depots there; the track must be removed a little in line, and the slope requires a little repairs; there are two pole pumps in the slope as far as the middle lift; the gangways are closed a little, and each pump lifts the water from their respective gangways; the Big vein here is split in two, and the Seven-feet vein is also worked here; the two branches of the Big vein is 24 feet thick, and the Seven-feet vein runs 8 to 10 feet=32 feet; the other veins south and north of these veins, can be approached by tunnels, and in due time this colliery cannot but bid fair to become a profitable one.

Gangways.—The eastern line is 1,600 yards off; the western ditto, 200 ditto; the verticle height from the bottom to the surface, is 290 feet; the water level gangway is 1,400 yards in; the upper ditto is in 1,200 yards; the second level gangway is in 800 yards; the west ditto is in 90 yards; the third level ditto is in 700 yards, and the west ditto is in 100 yards; in all, 6 gangways=4,290 yards; the slope is sunk on the Seven-feet vein to the water level, and for the balance of its length on the Big vein, of an area of 24+21+8 feet=180 square feet; two tracks, 43 inches gauge of 25lbs rail.

Ventilation.—Owing to sinking the slope, there is no regular system of ventilation, and it is contemplated to erect a steam fan for that purpose, as soon as necessary; there is a good furnace erected on the surface, and a traveling manway driving for the miners' safety, which will become, when completed, an upcast air-course for the fan; the slope then will be used for a downcast to the bottom; there the air splits, and the portion of air that courses west will return east under the slope in the Seven-feet vein, and pass into the Big vein by a cross-cut, and air both branches of the Big vein, in air-courses over the tops of the gangways along to the faces of both gangways; thence travel westward through the cross-headings from breast to breast in the headings through the pillars, and communicate at the outcast air-hole near the fan.

Engines.—One 90 horse pumping engine; two pumps, one a 14 inch, and one a 16 inch column, 18 inches+6 feet cylinder, rods 4 inches diameter; 20 feet fly wheel, 8 arms, rim 5×10 inches=50 square sections; one shaft 12 inches+9 feet; a drum ditto, 12 inches+14 feet; a 10 feet+12 feet drum; 5 spiders, 8 arms, laged with 6 inch planks; a pump wheel, 8 feet diameter, 8 arms, 12 inches face; drum pinion, 5 feet diameter, 8 arms and 10 inches face; an 18 inch spur wheel; 8 boilers in 4 nests, 30 inches+$20\frac{1}{2}$ feet long, 2 of which are 30 inches+40 feet long, 4 of which are *patched;* water supplied from the water pipes of the Minersville water company; a 50 horse hoisting engine, 16 inches+4 feet cylinder; both these engines are supplied from these 8 boilers; a 25 horse breaker engine, 12 inches+3 feet cylinder, rods $2\frac{3}{4}$ inches diameter; 2 boilers, 30 inches+20 feet, and

runs 70lbs steam; the machinery is in good order, and are shipping coal daily; 740 yards $\frac{3}{8}$ inch chain used in the slope.

Remarks.—As the colliery is now nearly idle, and the slope not yet in operation, and not as yet leased to any operator, very little can be said in reference to it, but what has already been said, as the gangways are not as yet turned nor the slope put in order, but its future prospects are favorable.

Recapitulation.—One slope 320 yards deep; 3 veins 32 feet thick; one visit, 11 miles; traveling in and out of the mines, 2 miles=13 miles; none killed or injured; 3 gangways=4,290 yards; 3 engines=135 horse power; 10 boilers=243 feet long; grate surface 125 square feet; 550 yards outside track, 640 yards slope track=1,190 yards T rail; 2 pumps; 740 yards $\frac{3}{4}$ inch chain; 25 men and boys employed; one horse; 16 wagons; 2 mules; temperature 78°; in slope, 44°; capacity, shipments, 10 cars per day; air $8\frac{1}{2}$ times slow. Officers' names: Harris & Brothers, Pottsville, agents.

East Pine Knot Colliery, *September* 21, 1869.

No. 75.—Greenberry Slopes.

Description.—I herewith submit a detailed description of this colliery as herein set forth. The colllery consists of 2 slopes—the East Pine Knot and West Pine Knot. The east slope is located on the south side of the Broad mountain, one mile north-east of the Mine Hill gap, and 2 miles north of Minersville, one ditto west of New Castle, and 6 miles north of Pottsville. The slope is sunk on the south dip of the Big vein; section area=24+20+8=176 square feet, and 235 yards deep. The estate is owned by Maurice Patterson; leased and operated by Fuller & Company; superintended by Major L. S. Baldwin. The coal is transported over the Mine Hill railroad. This colliery was formerly operated by Messrs. Charles Miller, Esq., and Hamilton Adams, and was a very remunerative colliery.

Gangways.—The west gangway on the lower level is 700 yards in, and 35 breasts open on it, each 10 yards wide and 75 ditto long; the vein dip, 65°; the pillars are 10 yards thick, and each breast has 2 schutes on it, and a manway drove in the pillars; area of gangways is $67\frac{1}{2}$ square feet. The east gangway is 400 yards in and now idle. There are 4 veins in this colliery—the Big vein is 16 feet thick; the south vein 5 feet thick; the Crosby vein 6 feet; the Leller vein 5 feet thick; total thickness of coal, 32 feet. The peculiar feature of the Crosby vein is, it forms 2 veins westward whilst it is all in one eastward. The west gangway on the Big vein is 46 yards under the east gangway of the West Pine Knot colliery, and 4 gangways on the west side make 764 yards, and 4 east gangways make 469 yards; the west gangway on the Leller vein is 40 yards; the east ditto is 624 yards=1,907 yards=5,721 feet long.

Ventilation.—The colliery is ventilated by a 10 horse fan, 12 feet diameter paddles, located on the west side of the slope. Rosser Rodricks has charge of the inspection of the gas. All the heading have 3 feet+5 feet area=20 square feet. A cross-cut into the Big vein, and the air traverses west over the gangway to the fan, and 60 yards ahead of the gangway, and returns back to the slope and goes in to the face of the Leller gangway. On the first turnout on the gangway of the Big vein, the air passes up into an upcast 12 yards across the slope, and goes into the west gangway. There are 2 escape traveling roads on the Leller vein. In the west side, up to the middle level here, there is a 12 feet wide slope with a track

laid, with an engine and car especially for the purpose of lowering and hoisting the men and tools, and an engineman constantly in attendance. This is an excellent plan and reflects great credit on the operators. I have discovered some gas in the colliery and directed *no other lamps but good safety lamps to be used; each miner must deliver his safety lamp to the lamp man to be unlocked, cleaned, examined, re-locked and put away, and such lamps to be numbered and registered on the lamp register, with the person's name using it, and the boss must examine each lamp as he hands it to its proper owner next morning before he enters the mines.* The fire boss, whose duty it is to examine all the localities where gas evolves, *must report the condition of each place first before any person enters his respective working place where gas evolves, and shall not enter unless such permission is first granted by the officer in charge, and none but experienced and skilled miners to work where such dangers are.* The air is conducted on systematical principles in these mines, and further comment is at present unnecessary. The outcast at the fan is to be changed a little to facilitate a better delivery of the air.

Engines.—Four hundred and fifty horse power pumping engine, 52 inches+10 feet cylinder, and used to work the four working barrels, of three columns; one 90 horse slope engine, and two 90 horse hoisting engines, 20 inches+5 feet cylinders; one 30 horse, for the use of the miners and tools; 15 feet wheel, 8 arms, 5+9 rim; one shaft 7+12 feet, and one 9 inch+16 feet; 2 boilers, 6 feet diameter, 7 tubes 30 feet long, and 6 boilers 42 inches+30 feet long; grate surface, 5×22=110 square feet; a 30 horse breaker engine, 15 inch+2½ feet cylinder; a 20 horse dirt plane engine, 12 inch+2½ feet cylinder, 4½ feet drum; 3 boilers, 36 inches +30 feet; 2 iron drums, 12 feet diameter; 3 spiders, 8 arms each; 9½ inch +8 feet shaft; one ditto 11 inches+19½ feet; 20 feet wheel, 8 arms, 5 +10 inch rim; one shaft 10 inches+16 feet long; 8 boilers, 36 inches+30 feet long; 2 S valves; grate surface 4½×24=108 feet; 7 engines=800 horse power; 19 boilers=438 feet long.

Remarks.—I found this colliery well supplied with power and kept finely in order, the officers very attentive in their duties. The colliery is well conducted on mining principles. I have recommended some changes in the ventilation of the mines by shortening the volume of air and changing the position of the fan, and increasing the headings sufficiently large to allow more room for a draft.

Recapitulation.—Thomas Lewis, a miner, was killed whilst riding on the cage in the slope, by the displacement of a sheave, throwing the cage off the track and crushing him to death; Sept. 2d, Patrick Murphy had an arm injured. One slope 235 yards deep; section area 24+20+8=176 square feet; one visit, 12 miles, in and out of mines, 3 miles=15 miles; 3 gangways=1,907 yards; 4 veins, 32 feet thick of coal; 35 breasts, 10 yards wide, 76 yards long; pillars 6 yards thick; 8 engines=815 horse power; 19 boilers=438 feet long; grate surface, 257 square feet; 770 feet wire ropes; 1,260 yards outside track=3,167 yards of T rail; 1 lifting ditto; 3 pumps; one fan and one furnace; 225 employees; 12 mules; 50 wagons; 2 escape roads; temperature, 61° outside; inside, 58° to 60°; condition of mines, fair. Officers: Maj. L. S. Baldwin, superintendent; 1st engineer, Jos. Wortley; 2d do., John Higgins, James and John M'Donnald, Robert Walker; chief do., George Turner. Air, 2¾ times slow; 1¾ miles=69¼ tons T rails laid.

No. 76.—West Pine Knot Slope.

September 22, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. This colliery is owned, leased and operated by the same persons and firm that now own, lease and operate the East Pine Knot colliery. The colliery is located one mile west of the East Pine Knot, and two miles north of Minersville, and seven miles from Pottsville by pike road. The slope is sunk on the south dip of the Big vein, at the foot of the Broad mountain, nearly opposite the Mine Hill gap and adjoining the Coal Castle burning mine. The slope is 237 yards deep; section area 24+20+8=176 feet; of two lifts. The coal and veins are the same thickness and quality. Both collieries are in active operation for 30 years, and yielded a vast production of the best sort of coal.

Gangways.—The east gangway is 550 yards in; the west do. is 1,110 yards in=1,660 yards. The company is robing out all the coal preparatory to sinking a new lift. A 50 yard tunnel reaches the Leller vein and the coal is faulty; 27 yards tunnel reaches the Crosby vein, the east gangway of which is 12 yards in; the west ditto is 250 yards in=262 yards. The Holmes vein is within 25 yards distance, and the vein 9 feet thick. The east gangway is 100 yards; the west ditto 275 yards in=375 yards. There are five veins on this colliery, *i. e.*, first, the Big vein, 22 feet thick; the Leller vein, 7 feet thick; the Crosby, 14 feet; the Church vein, 9 feet, and the Holmes, 7 feet thick; in all 59 feet thick of good coal. Six gangways=2,297 yards; 2 tunnels=77 yards; slope double track, 474 yards; total length of track in the mines, 2,848 yards=8,544 feet long; section area, 63 square feet.

Ventilation.—The ventilation is effected by a stack and air-holes. The manway is 15 yards east of the slope, and 80 yards up to the old level gangway, and across to the west side 20 yards above the slope, and 100 yards up; it comes out here and goes back to the slope air-course, thence to the outcast shaft.

Engines.—One 90 horse pump in the lower level, 18 inches+6 feet cylinder; 16 feet wheel, 8 arms, 5+10 inch rim; 10 inches+9 feet shaft, and 2 shafts, each 10 inches+14 feet; a 90 horse hoisting engine, 18 inches+6 feet cylinder; 16 feet wheel, 8 arms, 5+10 inch rim; 10 inches+18 feet shaft; one 12 inches+14 feet; one 8 feet, and one 2½ feet; pinions, 8 arms and a 10 inch face; 9 boilers, 6 of which are in 3 nests, 36 inches+28 feet long, and 3 ditto, 30 inches+20 feet long=228 feet long; 1 steam gauge, at 65lbs; grate surface, 117 square feet; a 30 horse breaker engine, 16 inches +2½ feet cylinder; 12 feet pulley wheel; 9 inches+9 feet shaft; 2 boilers, 30 inches+20 feet; the machinery and engines, boilers and fixtures are all in fine order; 1,000 yards of 1½ inch wire rope in use on the slope.

Remarks.—There are but few persons working in this colliery, as the company is now robing back all the coal which their predecessors left, and are now reducing the pillars, and mining out every second pillar; the air is tolerably fair, but there is a body of carbonic acid gas evolving, which, in its present condition, has no influence, and owing to no mining of any consequence being carried on, there is but little smoke, and no apprehension of danger on that score; further comment is unnecessary.

Recapitulation.—One slope, 237 yards deep; two lifts, section area, 24+20+8=176 square feet; 6 gangways=2,297 yards; no breasts; 77 yards tunnel; double the slope, 474 yards; 1,000 yards outside tracks=3,848 yards; one visit, 15 miles; in mines, 2 miles=16 miles; 5 veins, thickness

of coal, 59 feet; 1,000 yards $1\frac{1}{2}$ inch wire rope; 3 engines, 210 horse power; 11 boilers, 268 feet long; grate surface, 136 square feet; one 90 horse pump; no fan; 2 air-holes; 76 men and boys employed; 14 mules, 5 horses and 45 wagons; temperature 73° out; 66° ditto inside; air slow and full of black damp; water, 9 per cent. of mineral salt; shipping capacity, 40 cars per day; air seven times slow.

No. 77.—Manhattan Shaft Colliery.

September 23, 1869.

Description.—I inspected the above colliery, and herewith submit a detailed description of the same as herein set forth. The colliery is located on the lands of the Manhattan coal company, on the northern slope of the Mine Hill, at Heckschersville, in Glen Carbon valley, 8 miles north-west of Pottsville, and $3\frac{1}{2}$ miles north of Minersville, on the line of the Mine Hill and Ashland railroad. This is one of the first shafts sunk in the county, some 14 years ago, and at this day is in better condition than any I have yet visited. The whole lining of the shaft being composed of squared timber, 12+12 inches, and fitted edge to edge; the movement of the cage is imperceptible, and its different machinery in every part works smoothly. David Glover, Esq., superintended the shaft, and at that time superintended some eight other collieries for Mr. Richard Heckscher and company; two cages work in the shaft, and are separated by a substantial plank partition; the pumps are also covered in, and every thing secured in a workmanlike manner. The shaft is sunk on the Big Daniel vein, 84 yards deep; section area $22\times13=286$ square feet; the vein dip 33°; now operated by John John Wadlinger, Esq.

Gangways.—The Daniel vein gangways are 2,680 yards in, and its old counter gangways, 6,164 yards in, on the west side; 8 breasts working on this gangway, and 7 ditto on the new gangway=15 breasts; the west gangway on the Crosby vein is 500 yards in, to the tunnel on the Daniel vein, and 120 yards, and from this tunnel to the north tunnel is 100 yards to the new vein, and continued in 1,600 yards more; there are 45 yards of a tunnel to the North vein; the east gangway of which is 350 yards in; the west ditto, 700 yards=1,050 yards; area of this gangway is 56 square feet section; the aggregate length of all the gangways in the mines is 22,214 yards long, and 2,440 yards outside tracks; total length of T rail tracks is 14,699 yards=$8\frac{1}{3}$ miles.

Ventilation.—The downcast on the Daniel vein goes east to the tunnel; goes in by a crosscut, then west to the tunnel and into the new vein; ventilates the new vein and returns to the furnace, on the west side of the shaft, some 600 yards off, and located on the surface; the pillars are holed each in 3 places, so as to have an effectual way for the air to ventilate the breasts, and in this manner the air traverses faster, and dilutes better, and carries off the vitiated air much better, thus rendering the mines more healthy. The air comes by the gangways, then up into the headings and returns back through the working breasts and out to the furnace.

Engines.—2 50 horse hoisting engines (link motion) $13\frac{1}{2}$+36 inch cylinders, 3 inch rods; shaft 9 inches+6 feet; spur 22 inch+9 inch face; drum $8\frac{1}{2}$ feet+12 feet long; 3 spiders, 6 arms each, 9 inch planking; one $10\frac{1}{2}$ inch+14 feet shaft; a wrought iron break; 230 yards $1\frac{3}{4}$ inch wire rope in use 13 years, and is now in good condition. The large pinion wheel is

fixed in the middle of the drum, giving it additional advantage. One 4 horse donkey feed pump, and one 90 horse bull pump, 30 inch+8 feet cylinder; 6 boilers, 30 inches+33 feet long, and 2 do. 30 inches+35½ feet long =269 feet long; grate surface, 110 square feet; a 90 horse pump, 20 inches +7 feet, (link motion;) 6 boilers, 30 inches+33½ feet long=201 feet; grate surface 5×18=90 square feet; 2 thirty horse breaker engines=60 horse, 12 inch+12 inch cylinders; 12 feet wheel, 6 arms, rim 4+9 inches; 9 inch +10 shaft; one 4 feet wheel, and a 28 inch wheel, 8 arms, 12 inch face; 2 seven feet pinions and one 26 inch do., and one 5½ do; a shaft 12 inches +16 feet long; dirt plane drum, 7 feet diameter, 12 feet long; 2 spiders, 6 arms, and a 6 inch flange, cone gearing; gum belt 14 inches+55 feet long; 440 feet of 1 inch wire rope on the plane. There are 8 screens in the breaker for cleaning and sizing the coal, and the boilers are at the distance of 90 yards from the breaker.

Remarks.—I recommended a fan to be erected on the Daniel vein, four breasts from its face, and to place check doors on the different gangways. The air could be forced into the breasts and return through them to the upcast air-course, thence to the fan outcast. In this way the quantity of air necessary to ventilate any part of the mines could be easily supplied. There are three regular air-holes out to the surface. The lengths of the breasts vary from 70 yards to 170 yards. An escape road for the men to pass in is 500 yards west of the shaft. There is no possibility of any fire in the shaft, and another good escape road in the bull pump road, so that no danger need be apprehended from any accident in the shaft, while these escapes are open.

Recapitulation.—2 shafts, 252; number of miles to and from, 16 miles, in and out of mines, 6 miles=22; one visit; shaft, 84 yards deep; 6 gangways 12,259 yards; outside, 2,440 yards=8⅓ miles; 7 engines, 344 horse power; 14 boilers=470 feet long; 3 pumps; grate area, 190 square feet; 400 feet 1¾ inch wire rope, and 220 do. 1 inch do.=620 feet wire rope; one furnace; 3 air-holes; 102 employees in the mines, 120 outside, and 32 mules; 75 wagons; 5 horses, and 240 feet wire rope=860 feet; 2 good escape traveling roads out of the mines. The old shaft was then idle and filled with water, but measures are taken to put it in operation soon again. Temperature, 76°; do. inside, 48° to 54°; velocity of air, 5½ times too slow; condition of mines, good; gas, 5 per cent.; water, 7 per cent. of mineral salt; shipping capacity, 70 cars per day; dip of veins, 36°. Officers: Boss miner, —— ——; 1st engineer, Hugh Connery; 2d, John and Thomas Brittain, John Allen. 29 breasts working, each 360+30 feet.

No. 78.—Kear's Slope Colliery.

September 24, 1869.

Description.—I inspected this colliery, and herewith submit a detailed description as herein set forth. This colliery is located on the north side of the Mine hill, and on the west side of the Mine Hill gap, two miles north of Minersville and seven miles north-west of Pottsville. The buildings are all of stone and slated roofs. It is one of the most extensive and finished collieries in the State, in its appointments. It was formerly operated by the late Richard Kear, but at present by his brother, Thomas, and nephew, William. The colliery consists of 2 slopes, one of which is now solely used as a pumping slope—the new one a coal slope. It is sunk on

the north dip of the Mammoth vein, 300 yards deep; section area 24+20 +8 feet, 176 square feet. The present new lift is the third lift. There are 50 feet of a pillar left standing between the two slopes, and 16 feet of a pillar left to the pump slope, and 25 feet left standing on the west side, and 91 feet of a pillar left between that and the fan air-shaft. These four pillars are left standing for a permanent support for these slopes. Much credit is due to the Messrs. Kear for the excellent manner in which they have executed their work, and the large outlay, and the very superior manner everything is built and managed.

Gangways.—The first lift east gangway is 1,780 yards; the west ditto, 2,640 yards; the second ditto, is in 1,780 yards; the west ditto, 2,640 yards; the third east ditto is in 100 yards; the west ditto, 100 yards; the fourth east ditto is in 150 yards; the west ditto, 160 yards; the fifth, or lower, level is in 80 yards; the west ditto, 100 yards; aggregate length is 9,510 yards; the two tunnels are 72 yards—in all 9,582 yards. The Mammoth vein is 20 feet thick; the 4 gangways on it are=80 feet thick; the Leller vein is 6 feet; the Crosby vein is 8 feet; the Big vein is 16 feet; the Daniel vein is 6 feet. In all these veins the workable coal is 114 feet thick, all of which can be worked at the same time.

Ventilation.—A steam fan ventilates this colliery. The slope is used for a downcast to the lower level and goes to the Leller vein; runs east, along that gangway, to its fan, and returns through its breasts and headings to the tunnel; here it becomes an overcast air-course, and passes through to the face of the west gangway, and returns again back to the tunnel, to where the same overcast is divided to bring the air into the Big vein; and there the air is split and is made to work east and west, returning and terminates in the upcast, the section area of which is 36 square feet. This upcast shaft is not of sufficient area to receive all the returned air as it should, as the air is heavily loaded with gas and dust, of which element there is quite an amount of each. The lower lift is perfectly dry; there are no traces of water to be found in it, and this change indicates the strong presence of gas, and the amount evolved. The operators have a portable steam engine and hose in the mines, and convenient water tanks, that, in case of any accident arising from fire-damp explosions or otherwise, the fire engine can promptly be brought to play upon it and extinguish it at once; I consider a valuable auxiliary in mines.

Engines.—Two 100 horse power engines used for hoisting, $4\frac{1}{2}$ inch rods; 2 cast iron drums, 12 feet diameter, 8 timber arms; 12 inch+12 feet shaft; 24 inch+72 inch cylinder; link motion; one 6 horse feed pump; 10 boilers, 36 inches+24 feet, in 5 nests; 5 valves; grate area, 5×30=150 square feet; one 40 horse engine used for lowering and hoisting men and tools; 8 feet+8 feet drum; 4 spiders, 6 arms, laged with 9 inch plank. This engine is located 53 feet from the slope, on the west side, which makes a first-class traveling road and a safe escape. One 150 horse bull pumping engine, 33 inch+9 feet cylinder, and a 6 horse feed pump; 10 boilers, 4 of which are 34+31 feet, and 6 do. 34 inches+30 feet=304 feet long; 3 columns, 20 inches diameter; one 20 horse fan engine, 14 feet diameter; 6 paddles, 4×4=16, 96 square feet; 3 feet fan pulley; power pulley, 18 feet diameter; 6 inch+6 feet shaft; a 14 inch gum belt used; one 30 horse breaker engine; 3 boilers, 30+25 feet, 75 feet long; one 30 horse dirt plane engine; 3 boilers, 30+30 feet long=90 feet. 9 engines=480 horse; 26 boilers=709 feet long. No person but the most reliable men employed in and about the colliery. A saw mill attached.

Remarks.—I found no better works in the county, and am pleased to say the firm is not sparing any expense in making it a model colliery. I recom-

mended the cross-holeing from vein to vein, and erecting doors and closing schutes with plank batteries, so as to shorten the volume of air as much as practicable; and to erect another fan on the east side to work the eastern division of the mine. This would, beyond a doubt, clear the whole mines of all noxious gases or deleterious air, formed in the mines by the contact of gas and vapor with dust formed of coal. I found no better managed mines in the county, and the Messrs. Kear do not shrink from any responsibility that rests on them to make the colliery such. The breaker is too near to need the use of mules.

Recapitulation.—2 slopes, 1 of which is 300 yards deep, section 24+20+8=176 feet; the other, 210 do., 20+18+8=152 square feet, each having 2 tracks. One visit, 14 miles, by pike road; in and out of the mines, 3 ditto=17 miles; 10 gangways—aggregate length, 9,510 yards; 2 tunnels, 72 yards; outside tracks, 460 yards; total, 10,042 yards; 5 veins; the coal is 57 feet thick; 9 engines=480 horse power; 26 boilers=709 feet long; grate surface, 338 square feet; 3 pumps; 800 yards $1\frac{3}{4}$ inch wire rope; 500 ditto $1\frac{1}{4}$ inch rope, and 500 feet chain on dirt plain=1,300 feet wire rope; one 20 horse fan ventilator; 125 men and boys; 5 mules; 60 wagons; temperature outside, 76°; ditto inside 68°; air, $1\frac{1}{2}$ times too slow; gas, amount 20 per cent.; acidulated water, 8 per cent.; shipping capacity, 100 cars per day; will ship 200 cars per day. Officers: Thomas Kear and William Kear, operators and bosses; 1st engineer, Aaron Tobey. Dip of veins north, 53°; 20 breasts working, each 30+200 feet; 24 feet pillars.

No. 79.—Preston Red Ash, No. 1, Colliery.

September 27, 1869.

Description.—I have inspected this colliery, and say the colliery consists of 2 drifts, one the Skidmore vein; the west gangway is 1,600 yards in; and the other drift, on the Red Ash vein, is 800 yards in; in all, 2,400 yards. The miners made complaints of the bad condition of the air, and after due care and investigation, I found the complaints substantially correct. The colliery is located on the south side of Locust mountain, at Girardsville, 3 miles east of Ashland, and 16 miles, by road, or 37 miles, by railroad, north of Pottsville, and 9 miles west of Mahanoy City, on the estate of Dr. Preston, and formerly the estate of the late Stephen Girard, of Philadelphia; now leased and operated by Messrs. Buckley & Moody. The two gangways run west and are used as intake air-courses. There are no furnaces of fan ventilation used, but suffer the air to vibrate by the influence of the atmosphere, and there is not sufficient force created by this mode of ventilation to, in the least, affect the powder smoke, but what little influence the vapor has on it. The miners complain of sickness. I recommended a plan to Mr. Williams, to open an outcast air-course, and also an escape traveling road. The original upcast air-course is 500 yards in from the drift mouth, and is all closed up with *debris*. To put two doors on the gangway, to check the air and force it into the headings, and pass from breast to breast along to the outcast. The Red Ash mines are attempted to be ventilated by a furnace, which is unfit for the work, from its smallness. It is located at the surface. The air passes in the gangway on the lower level, and passes along, through the breasts, to the upcast, and passes out by it. The furnace is secured, so that there need be no apprehension of

the mines taking fire. The stack of this furnace is only 12 feet high, and 16 square feet section.

A 20 horse breaker, 12 inch+3 feet cylinder; 9 inch+9 feet shaft; two pulleys, one 10 feet, and one 4 feet diameter, running 4 gum belts, one 70 feet long, one 60 feet, and 2 eight feet; also 7 screens, two 4+30 feet long, three do., 4+8 feet long; 2 boilers, 30 inches by 25 feet long; grate surface, $4\frac{1}{2}\times5$ feet==$22\frac{1}{2}$ square feet running at 40lbs steam; 200 men and boys employed; 8 mules; 45 wagons; shipments, 40 cars per day.

Recapitulation.—2 drifts, 2,490 yards long; 670 yards outside tracks==3,700 yards; one 20 horse engine; 2 boilers, 50 feet long; 12 breasts, 10 yards wide, working one furnace; 2 veins, 10 feet thick; 200 employees; 8 mules; 45 wagons; air, 13 times too slow; condition, illy managed and miners suffering from smoke and black-damp; shipments, 40 cars per day. Officers: Abraham Williams, boss miner. 45° south dip; area of gangways, 53 square feet; distance traveled, 37 miles, in and about the mines, 3==40 miles; temperature, 76°; inside, 66°; difference, 10°.

No. 89.—Ledger Vein Slope.

Inspected September 28, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. The colliery is located on the estate of the Philadelphia Ledger company, Messrs. Swayne & Simmons, at Silver creek, at the terminus of the Silver Creek branch of the Schuylkill Valley railroad, on the western side of the mountain gorge near the Schuylkill navigation company's reservoir, near that locality, or the Tory feeding grounds; it is situated 9 miles east of Pottsville and 19 west of Tamaqua. The colliery consists of a slope sunk on the south slope of the Broad mountain on the south dip of the Skidmore vein, 100 yards deep of a section area of 20 by 16 by 6 feet=108 square feet; two tracks 42 inches gauge. The colliery is leased and operated by E. C. Whitlesy; the east gangway on the lower level is 800 yards in; the west ditto, is 350 yards in, and in fault; the west gangway on the Big vein, 1,200 feet, is also in fault, owing to the great confused state of the mountain here; the breasts run up 15 yards, and are completely cut off by the meeting of the top and bottom slates; the east gangway on the lower level, is drove some 2,500 yards; no gangway drove west, owing to the veins being cut off by the interruption of the rock fault; the second tunnel on the lower level is 25 yards long, and dip south; the gangway runs in west 400 yards to a fault, and all robed out; this counter gangway is on the Skidmore vein; at this second tunnel, the Big vein is in 700 yards east, and the west ditto is in 400 yards, and all robed out; the east gangway has a run of 300 yards more to the line; gangway area is 58 square feet; 1,200 yards from the slope, the Big vein splits off and runs eastward parallel with the main gangway, 300 yards; the parting slate, 37 yards thick; there are 10 breasts on the north gangway, and 4 ditto on the south ditto=14 breasts, each 10 yards wide, and 7 yards pillars each holed 15 yards up; the coal is free workable coal; the North vein is 12 feet thick; the South ditto, 20; the Skidmore is 10 feet, and the Seven-feet vein, the Buck mountain vein lies north 120 yards, and is 16 feet thick; 5 veins==65 feet thick; at present only two veins are worked.

Gangways.—Slope 300 feet deep; east gangway on lower level of the Skidmore is in 800 yards=2,400 feet; the west ditto is in 1,050 feet; west

gangway on Big vein is in 400 yards in faults=1,200 feet; east ditto, lower level is in 7,500 feet; the west ditto, is in 1,200 feet, and in fault; the Big vein east gangway is in 2,100 feet, and the west ditto is in 1,200 feet; the east gangway from the split off is in 900 feet; 8 gangways equals 17,550 feet; average area of 58 square feet.

Ventilation.—The slope is a downcast; the air runs east to the Big vein tunnel, returns to the south vein, and thence to the split off, returns west to the incline plane in the tunnel, thence up to the water level, and thence 100 yards west to a furnace erected on the surface.

Remarks.—The area of the air-courses is too small, only from 9 to 7 square feet. I condemned a portable furnace I found in the tunnel. There is no free ventilation. I desired the air-courses to be enlarged of an area of 36 square feet. I measured the air in the gangway and found it $22\frac{1}{2}$ times too slow. The furnace ventilation here is not adaquate to supply fresh air, and powder smoke and vapor and gas permeates the whole mines. I directed the leakages to be closed and to keep canvas on the draw-holes. This colliery is in a bad state. There are two safe traveling roads out of the mine.

Engines.—One 90 horse engine for pumping, 18 inch by $6\frac{1}{2}$ feet cylinder; one 50 horse ditto, for hoisting, 15 inches by $5\frac{1}{2}$ feet ditto; 14 feet wheel, 6 arms, 4 by 8 inch rim; one drum, 8 feet by 10 feet; 4 spiders, 6 arms, 8 inch timber laging; a 7 feet pinion wheel, 8 arms, 9 inch face; $8\frac{1}{2}$ inch by 14 feet shaft; the fly wheel shaft 8 inches by 6 feet; the pump wheel 18 feet, 8 arms, 12 inch rim; pump shaft, $12\frac{1}{4}$ inch by 16 feet long; one 20 horse breaker engine, 15 inch by $2\frac{1}{2}$ feet cylinder, and a 15 horse dirt plane engine; 10 boilers, 4 of which are 30 by 20 feet long, and 6 ditto, 30 by 30 feet long=260 feet long; 750 feet $1\frac{1}{4}$ inch wire rope in slope, and 150 feet 1 inch ditto on plane=900 feet.

Recapitulation.—4 engines=175 horse power; 10 boilers, 30 by 30=260 feet; 1 dirt plane, 80 feet long, one track; slope 300 feet deep; area, 20 by 16 by 6=108 square feet; area of gangways, 58 square feet; area of grate surface, 136 square feet; 900 feet of ropes; one furnace and stack; 8 gangways=17,550 feet long; 1,700 feet outside tracks, 42 inch gauge, 25lb rail; 150 men and boys employed; 13 mules and 50 wagons; ships 40 cars per day; can ship 80 cars with the same force; air, $22\frac{1}{2}$ times too slow; temperature outside, 47°; ditto inside, 69°; difference, 22°; 7 per cent. of gas; 8 per cent. alum water; number of visits, one; distance, 18 miles—in and out of mines, 4 miles=22 miles; length of track laid, 19,250 feet=$3\frac{5}{8}$ miles=$148\frac{1}{4}$ tons T rails; 12 years in operation; 14 breasts, 45 feet long, 30 feet wide; 21 feet pillars; 2 upcast air-holes; one furnace; no fan; the air is full of smoke and the miners complain a little. The firm intend to soon remedy this evil by erecting a 15 horse steam fan, and otherwise improve the air-courses by enlarging them, and also to drive out a good safety traveling road for miners and mules. This done, and the mines will soon be in a state of good ventilation, and otherwise improved.

No. 81.—Silver Creek Colliery.

Inspected September 29, 1869.

Description.—I herewith submit a detailed description of the above colliery as herein set forth. The colliery is located at the terminus of the Silver Creek branch road of the Schuylkill Valley railroad, on the east side of the gorge in the mountain, on the estate of the Valley furnace company, for-

merly operated by John Tucker, Esq., and at present by Messrs. Murry, Winlack & Randal. The colliery consists of two slopes or lifts; the old slope is sunk on the south dip of the Skidmore vein, 229 feet deep at an angle of 45°; the slope is in a very bad condition, and has closed in some four weeks after inspection. I warned the miners of the danger of the old slope to close at any time for want of sufficient timber, and I urged its repair at once; the new slope is sunk on the east gangway inside the turnout some 110 yards east of the old slope, and is 110 yards deep; at the head of this slope the vein forms a north and south dip of 45°. A tunnel from the South vein to the North vein, a little east of the slope, opens the North vein, and gangways turned on each. There is a large deposit of coal on the tract consisting of the Buck Mountain vein, 16 feet thick; the Black Heath, 10 feet thick; the Big vein, 22 feet; the Skidmore, 12 feet thick; the Seven-foot vein and the North Dip vein, 13 feet; in all, 80 feet of coal. Area of new slope 21+19+10=200 square feet, having 2 tracks of 42 inch gauge, one pump road 48 inch do., and a good traveling road 42 inch ditto. By the closing of the old slope 9 mules perished by drowning, the miners all escaping by the air-courses to the traveling road on the west of the old slope, which I directed to have secured in the event of an accident in the old slope, as it was imminent at any moment to close in, as the timber indicated them.

Gangways.—The old Big vein gangway runs east and west some 3,600 feet+4,200=7,800 feet; the new slope east gangway is in 1,200 feet; the west ditto 600 feet and the South vein gangway is in 180 feet, and 180 of a tunnel=9,960 feet of gangways.

Ventilation.—The air-hole passes over the top of the saddle and is carried along the new slope to the fan air-shaft. The fan works in an open frame exposed to the atmosphere all round, and was kept idle these last four months; its diameter is 8 feet; 6 paddles; area, 42 inches+26 inches =7½ feet. The ventilation is very bad, and the action of the steam pump, or steam and heated air, tends to made the air bad, and give the timber the dry rot.

Engines.—One 60 horse hoisting engine inside in the new slope; 16 feet wheel, 6 arms, rim 5+7=35 square inches; 18 inch+4½ feet cylinder; 10 inch+8 feet shaft; 8 feet+9 feet drum, and 4 feet+8 feet drum each; 4 spiders, 8 arms each, with 8 inch timber laging; 2 shafts, each 10 inches+ 16 feet; one 6 feet pinion, 8 arms, and 12 inch fan; 8 boilers 34 inches+ 36 feet long=288 feet, which furnish steam for the bull engine and the steam pump in the new slope; 150 horse bull engine for pumping purposes, 36 inches+10 feet cylinder; 1,200 feet rope; 1⅛ inch; 4 horse supply pump for boilers; a 6 horse fan engine; a 60 horse slope engine, and a 4 horse feed pump, 18 inch+5½ feet cylinder; 18 feet wheel, 6 arms, 5+9 rim; 3 shafts, one 10 inches+10 feet, one 10 inches+16 feet and one 11 inches+16 feet; a 7 feet and 5 feet pulley on a 22 inch spur; 4 boilers 34 inches+36 feet long; 20 horse breaker engine; 4 boilers 30+28 feet long. All of the boilers and machinery are in good condition, and water good.

Remarks.—I found the old slope in a very dangerous condition, threatening at any moment to close in, which it did a few weeks after. I received but little satisfaction for directing the security of the slope. Five mules perished, and all the engines, pumps, pump machinery, ropes, wagons and railroad material are buried in the ruins, the miners escaping by the air-courses to the escape traveling road, which I timely ordered to be open. The air in these mines is, unfortunately, bad, with some gas and smoke, the fan being left idle for months, and no furnace used. I apprehended mischief to occur, and therefore notified the miners of the danger.

Recapitulation.—One visit, 18 miles; in and out of mines, 3 ditto=21 miles; none killed or injured; 2 slopes; 2 lifts; 4 tracks, 42 inch gauge, 25lb. rail; 6 gangways, 9,960 feet long; 1,680 yards outside track=15,000 feet T rail; 9 breasts, 30 feet wide; 21 feet pillars; 5 veins, 80 feet thick of coal; dip, 45° south; 6 engines, 244 horse power; 16 boilers 36+36+28 feet=544 feet long; 1,200 feet $1\frac{1}{8}$ inch wire rope; grate surface, 200 square feet; 2 pumps; 6 horse fan, 8 feet diameter, section area 45 square feet; 150 men and boys; 20 wagons; 5 mules; one escape road; temperature outside, 54°; inside ditto, 72°, 86° and 138° at fan; condition of air, $23\frac{1}{5}$ times too slow; 9 per cent. acid water; 8 per cent. gas; condition of colliery outside, good, also new lift; the old works very bad; shiping capacity, 45 cars per day.

No. 82.—Beach Wood Colliery.

September 30, 1869.

Description.—I herewith submit a detailed description of this colliery as herein set forth. The colliery is located at Mt. Laffy, at the terminus of the Mount Carbon railroad, at the base of the southern slope of the Mine Hill. The slope is sunk on the south dip of the Big vein, at an angle of 49°, 780 feet deep; two tracks 44 inches gauge, of 26lbs rail; one pump track and manroad; section area 22+18+8=160 square feet;. it is situated five miles north of Pottsville. The colliery is operated by Potts & Seigfried, and is one of the oldest in the county. Much black or choke damp pervades this mine, owing to the great irregularity of the air courses, although Mr. Baddow, the mining boss, has attempted a good plan for ventilation, his predecessors have not contributed to this end, and therefore the ventilation is poor; the Seven-feet vein is full of fire damp, and all the mine is more or less charged with both gases; the temperature is therefore high, varying from 68° to 78° within 100 yards of the bottom of the slope; although the water percolates freely through the fissures of the rocks; there is great danger to life in these mines, and in consequence of this, I have condemned the use of naked lamps on any pretence, and have strictly enjoined George Jones, John Ruse and James Duffy, fire bosses, not to suffer any naked lamps pass inside the first out-let, and first see that the working places were all clear of gas, or report their condition, and prevent the men entering whilst there was any danger from gas. Yet, on the 19th of November, an explosion took place, whereby eight men were burned, some badly; and after repeated inquiry into the cause, I failed to receive such information of how it occurred.

Gangways.—Four gangways=10,000 feet; 66 square feet area; ventilation is effected by a steam fan; the upcast air course is only 30 square feet section area, (too small;) the east and west air courses are of the same area, and therefore cannot supply a sufficient current of air, the outcast being too small; the air passes into the Seven-feet vein and traverses it eastward, comes down the 20 foot dip into the Big vein, passes into the fan along the air-course, thence returns through the east lower gangway, through six breasts, follows the west gangway to the slant gangway, communicates with all the breasts across the slope to the air-course on the west of the slope, airing the two west gangways and returning to the outcast shaft at the fan; the ventilation is not at all adequate to benefit the mines, and herefore danger is imminent any moment; the very strictest vigilance is needed.

Engines.—One hundred horse power pumping engine, 22+6½ feet cylinder, 16 feet wheel, 8 arms, rim 6×10=60 inches; 12 inches+17½ feet shaft; 10 feet+8 feet drum; 8 feet pinion, 8 arms, 14 inches face; 12 feet+11 feet drum; 12 inches+15½ feet shaft; 90 horse hoisting engine; 20 inches+6 feet cylinder; 7$\frac{10}{12}$ pinion, 8 arms, face 12 inches; spur, 2½ feet diameter; 8 boilers, 36+31 feet=85lbs steam; a 14 inch pump column, 450 feet long, and one 16 inches ditto, 225 feet long; 20 horse fan engine; 14 feet diameter, 12 inches+2 feet cylinder; pulley, 9 feet; fan pulley, 30 inches diameter; 76 feet 14 inch belt; 20 horse breaker engine, 12 inches+2½ feet cylinder, running 8 screens; 6 horse feed pump; 2 boilers, 34 inches+21 feet; 1,800 feet 1½ inch rope; an iron tank and a wooden ditto, contains 2,160 cubic feet of water; 5 engines=236 horse power; 10 boilers=290 feet.

Remarks.—The slope is 780 feet deep; 2 tracks, 44 inches gauge; dip at an angle of 49° south; 4 veins; the coal is 40 feet thick, and very good; the percentage of gas in this mine is not less than 20 per cent. of the whole volume of air in the distant parts of the mine; from the foot of the slope, the coal lies nearly flat; the engines and boilers are all good; the outcast is quite too small, and the fan not working right with the air-courses, being as large as the outcast, the air cannot be forced through the courses sufficiently strong, nor cannot be so well confined as to effect a proper ventilation. I have recommended the proper remedies, and promises made me they shall be fulfilled.

Recapitulation.—One slope; one lift, 780 feet; two tracks, 44 inch gauge, 25lbs rail; pump road, 48 in.; manway, 42 in.; area of slope section 22+18+8=160 square feet; 4 gangways, 10,000 feet; 1,676 feet outside track; in all 11,676 feet of T rail, 25lbs per yard; 5 engines, 236 horse power; 13 boilers, 380 feet long, 85lbs steam; one 100 horse pump; 1,800 feet 1¼ inch wire rope; 4 veins, 40 feet thick; fire surface, 170 square feet; 20 horse fan, 14 feet diameter; one downcast, one upcast; 210 men and boys; 12 mules; 50 wagons; 2 escape roads; 21 breasts, 33 feet wide, 240 feet long; 24 feet pillar; temperature outside, 42°, inside ditto, 76°, difference, 34°; miles, 10 inside and out, 8 ditto=18 miles; current of air 7½ times too slow; per cent. of gas in volume 20; ditto of mineral salts in the water, 17; condition of colliery good; shipping capacity, 60 cars per day. Killed July 2, George Gallager; injured, Thomas Martin, ankle crushed in rolls; eight men burned by explosion of gas, November 19; 36 years in operation, and that constantly. Not having received the proper information as to the cause of the explosion, no record of it is made until in my next report.

No. 83.—Revenue Colliery.

October 1, 1869.

Description.—I herewith submit a detailed description of this colliery as herein set forth. The colliery is located near Mt. Laffy, 4½ miles north of Pottsville, near the terminus of the Mt. Carbon and Norwegian railroad, on the estate of Wadesville shaft company; leased and operated by George H. Potts and Wm. Rickert. The slope is sunk on the south dip of the Peach Orchard vein, 600 feet deep; area of section, 20+18+8=152 square feet; 2 forty inch tracks of 25lb. rail; one 48 inch pump road; dip, 15° south. These mines are a slope and drift. The mines are operated a long time—some 34 years—and is still in a good condition, but much gas and smoke prevail.

Gangways.—The west lower gangway is in 180 yards; area of section, 51 square feet; coal, 6 feet thick; 7 breasts, each 30 feet wide and run up 90 yards, with 30 feet pillars. The east gangway is in 215 yards, of an equal area; has 12 such breasts open on it; a 600 yards of a drift gangway on the Red Ash flat vein, with 9 breasts working on it; in all, 895 yards gangway, with 28 breasts of coal. Some of the old gangways are still working.

Ventilated by a 15 horse fan, 9 feet diameter, making 70 revolutions. They use a breast for an air-hole and have a traveling road on the east side of the slope, the section area of which is $27\frac{1}{2}$ square feet. There is much gas and loaded with choak-damp in out of the way districts of the mine; no regular air-courses in the old levels, but such as come through old fallen in breasts. The drift mines are ventilated by a furnace; the vein is flat and the draft only moderate; the gangway is an intake to the fan, and air returns through the headings to the furnace outcast shaft.

Engines.—A 40 horse engine used at the slope, 16 inch+4 feet cylinder; shafts, drums, wheels strong; 4 good boilers, 34 inches and 30 inches+30 feet long=120 feet; 113 lbs steam; grate area, 52 square feet; valves and water good; the beams stamped; a 15 horse fan engine, with its gearing all good; a 30 horse breaker engine, all in good condition, working 7 screens; 3 engines; 4 boilers 30 inches+21 feet, 2 of which are patched; 3 engines=85 horse; 8 boilers=204 feet long; grate area, 108 feet; 1,550 feet $1\frac{1}{4}$ inch wire ropes in use at slope.

Remarks.—The air-courses are all too narrow and the outlet at the fan not properly placed. The air-holes should be 36 square feet section area, and the fan outcast shaft not less than 72 square feet section area. I measured the air in the west gangway and found it to be $14\frac{1}{2}$ times below the standard of ventilation. I recommended a new air-hole to be opened near the slope that would communicate with the fan air-course, which could be used for an escape traveling road, and an additional air-course to alter the position of the steam fan and secure all leakages of air, and the holes in the headings increased, which would remedy the evil.

Recapitulation.—3 engines; 15 horse dirt plane engine=85 horse; 8 boilers, 34 and 30 inches+30 and 21 feet long, 204 feet; 108 feet grate surface; water good; one killed; — injured; 1 visit, etc., 13 miles; one slope 600 feet deep; one drift 600 yards long; one fan, 15 horse, 9 feet diameter; one grate furnace; 3 gangways, 895 yards long; 28 working breasts, 30 feet, 270 feet long; one pole pump; 10 inch column; 700 yards track 25lb rail outside; total length of T rail tracks inside and out is 6,585 feet; 125 men and boys; 10 mules; 50 wagons; air, $14\frac{1}{2}$ times slow; volume of gases, 13 per cent.; ditto water, 6 per cent.; shipping capacity, 60 cars per day. Officers: Pomroy & Co.; Thomas Rickert, agent; boss miner, Wm. Henson; 1st engineman, Thomas Cummins, Robert Dillin.

No. 84.—Dexter Colliery.

October 2, 1869.

Description.—This colliery is located near Mt. Laffy, on the eastern side of the Mount Carbon railroad, on the estate of ———, leased and operated by Russel, Evans & Llewellyn. It consists of a new slope, sunk on the south dip of the Big Tracy vein, 300 feet deep, 32° dip south; area of section, 16+14+7=105 square feet; two tracks, 42 inches gauge; no fan or

furnace used; the firm are working the Big and Little Tracy veins, which are not very encouraging; the colliery is an old one, having all the upper levels worked out.

Gangways.—Big Tracy west gangway is 230 yards in; the east ditto, 55 yards; a tunnel south 41 yards to the Little Tracy; east gangway on it is 55 yards in; the three gangways=381 yards; the breasts have each four schutes, and five yards from the heading to the gangway.

Engines.—A 30 horse hoisting engine, 15 inches+2½ feet cylinder, and a 20 ditto breaker engine; 6 boilers, 30 inch+30+24 feet=156 feet long; grate surface, 4½+18=81 square feet; the safety valves are on the pipe in centre of the boilers, and runs as high as 120lbs steam; I directed not to run higher than 90lbs; the beams are stamped, and no warrant for such pressure; a nine inch steam pump in the slope, 9 inch cylinder and 6 feet stroke; 180 yards ⅝ inch 3 plat chain, and 180 yards 1⅛ inch wire rope, bad.

Recapitulation.—300 feet deep slope, 16+14+7=105 section; 2 tracks, 42 inches gauge; 40 inch pump track; two engines, 50 horse power; six boilers, 156 feet long; 540 feet chain; 540 feet rope. Killed, none; injured, none; one visit, 12 miles; 3 gangways, 1,143 feet long; 6 breasts; 42 men and boys; 2 mules; 11 wagons; 200 yards west and 2,500 yards east to the line of tract; inside temperature, 48° to 68°, outside, 44°; 120lbs steam; 10 horse pump; no fan or furnace; one good escape road; air 6½ times too slow; no gas; water good; capacity of shipments, 40 cars, shipping only 15 per day; outside track, 600 feet, 42 inches gauge, 25lbs rail.

Remarks.—Atmospheric ventilation, an air on the west gangway on the Big Tracy vein, which runs up to the water level, and then holed through to the Little Tracy vein, and thence out to the surface. I found the air 6½ times too slow, but there was sufficient air for the purpose, as there was but little doing at the time. I directed another air-hole drove out on the east gangway at its pave, which would serve both for an air-hole and a traveling road. There will be some gas created here soon. Three veins worked on the tract: the Daddow vein, 6 feet thick, the Big Tracy, 6 feet, and the Little Tracy, 3 feet=15 feet of coal.

No. 85.—Duncan Slope.

October 7, 1869.

Description.—This colliery is located two miles north of Pottsville, near the line of the Norwegian and Mount Carbon railroad, on the estate of the Duncan coal company, who are now operating these mines. The colliery consists of a very deep slope and some drifts; the slope is sunk on the south dip of the Lewis vein, some 1,500 feet deep, on a dip of 25°, section area of which is 24+18+6=126 square feet; these mines are 15 years in operation, and now is working the third lift; the slope requires some timbering, also the west gangway; there is a fearful body of gas in these mines, but the mines are perfectly dry and warm; outside temperature 82°, whilst inside it ranged from 52° to 73°; this colliery is quite profitable, owing to its proximity to the canal and the Atken's furnace; the air courses are worked with some skill, and every thing done to secure the miners and mines against accidents; the safety lamps are the only lamps used, and the government of the mines is rigidly enforced and the miners are very cautious in the mines.

Gangways.—The east gangway is in 500 yards; the west gangway, 900 yards=1,400 yards, and 350 yards driven in the new drift; in all 1,750 yards of gangway; some 28 breasts are working now, and soon will have 30, each 12 yards wide; pillars, 6 yards thick, 200 feet long.

Ventilation.—The mines are ventilated by a 30 horse steam fan, 10 feet diameter—its fixtures all good; the pillars are all holed every 20 yards up; the slope is used for a downcast air-course, and a thorough air-course carried along the tops of all the breasts, and a regular air-course carried all along the gangway at its face; the air then is made to pass up into the working breasts, and return through the headings and breasts to the upcast air-course, and thence to the fan shaft and out at the surface; some of it made to return down to the bottom of the slope and pass up the old level gangway, and return up to the fan outcast shaft.

Engines.—Eighty horse pumping engine, 20 inches+6 feet cylinder, 16 feet wheel; a 10 inches+8 feet shaft; 7 feet pinion, 14 inch face; a 12 inches+8 feet shaft, and a pump shaft 12 inches+16 feet; the pumping rods are 12+14 inch timbers; 2 horn drums for flat chains; 3,300 feet of $\frac{3}{8}$ inch flat chains; 60 horse slope engine, 20 inches+6 feet cylinder, $3\frac{3}{4}$ in. rods; 18 feet wheel, 8 arms, 6+10 rim; 8 feet+10 feet drum; 4 spiders, 6 arms, 14 inches timber lagings; 8 feet pinion, 14 inches face; shaft, 10 inches+8 feet long; 8 inch steam pump in the slope, 6 inches column; 6 boilers, 32 inches+30 feet long, 12 years in use, running at 80lbs steam; valves good and beams stamped; area of grate surface, 5+18=90 square feet; 30 horse steam fan engine, 12 inches+3 feet cylinder, 12 feet wheel, 6 arms, 5+6 rim; an 8 feet and $2\frac{1}{2}$ feet pulleys; fan, 10 feet diameter, 3+$3\frac{1}{2}$ paddles=$10\frac{1}{2}$ square feet=63 square feet section area; 6 inches+$3\frac{1}{2}$ feet shaft; 30 horse breaker engine, 12 feet wheel; 18 inch fan; 3 boilers, 30+15 feet long; thus, 5 engines=220 horse, 9 boilers=225 feet long.

Remarks.—I measured the air in the west gangway, and found it $9\frac{1}{3}$ times too slow, and it should be so concentrated as at least to be $2\frac{1}{2}$ times too slow; this must be effected by increasing the areas of the outcast air-courses, and closing all leakages which will greatly increase the draft; the fan only made 36 revolutions, it should make 110 per minute to discharge the required volume of air, and create a perfect ventilation of these mines; there is an air-hole in the 16 breast, 150 yards west of the fan on the counter gangway, and another in No. 10 breast, and another in No. 1 breast, and at No. 2 breast there is a cross-hole into the upcast; the first air-hole is 8 yards west of the slope, on the lower level gangway, but this should be the traveling road, and it is now decided to make it so, and close all the schutes with plank batteries well cemented.

Recapitulation.—One slope 1,500 feet deep; 3 lifts, 24+18+6=126 square feet; 2 tracks, 44 inches; 1 pump track, 48 and 40 traveling road; 3 gangways=1,750 yards; 5 engines=220 horse power; 9 boilers=225 feet long; 3,300 feet $\frac{3}{8}$ inch flat chain; killed or injured, none; one visit, 7 miles; one drift, 35 yards long; 28 breasts; one vein 8 feet thick; 25° dip; grate surface, 117 square feet; 5,250 feet inside track; 860 feet outside track, 25lb. rail=4,160 feet, 42 inch gauge; one 20 horse fan engine, 10 feet diameter; 110 men and boys; 13 mules; 30 wagons; temperature outside, 82°; inside, from 52°, 68° to 73°; air, $9\frac{1}{3}$ times too slow; gas, 13 per cent.; acid water, 8 per cent.; gangways area, 63 square feet; shipping capacity, 60 cars per day; condition of mines, fair.

No. 86.—Crest Franz Slopes.

October 8, 1869.

Description.—These slopes are sunk on Wetheril & Seitzinger's estate at Wadesville, 3½ miles north of Pottsville, on the east branch of the Mt. Carbon railroad; operated by Mr. Franz. The No. 1 slope is sunk on the south dip of the Orchard vein, dipping 15°, 300 feet deep; section area, 16+12+6=84 square feet; one 48 inch tract; one 48 pump track, and a 40 inch man road. The coal is from 6 to 9 feet thick. West gangway is in 60 yards; the east ditto, 600 yards=660 yards long. No. 2 slope is sunk on the Lewis vein, 135 feet deep, south dip 16°; the section area is 14+12+6=98 square feet; one track, 42 inch; one 44 inch pump track. The slopes are 150 yards apart; the breaker stands midway; a traveling road in each of these slopes.

Engines.—A 40 horse engine at No. 1 slope, 16 inch+4 feet cylinder; 13 feet wheel; 7 feet pump wheel; 6 feet+8 feet drum; 8 inch+12 feet shaft; wheel ditto, 6 inches+6 feet; 2 boilers, 30 inches+20 feet; grate area, 26 square feet; 90 lbs steam on beam; cleaned and examined according to law; pump a 14 inch working barrel, and a 16 inch column; 350 feet ⅝ chain.

No. 2 slope.—A 40 horse engine, 16 inch+4 feet cylinder; 16 feet wheel; 9 inch+6 feet shaft; 7 feet+8 feet drum, 6 inch timber lagings; one 8 inch+12-feet shaft; 8 feet pump wheel, 10 inch face; 4 boilers 30 inches+20 feet long; 4½+12=54 square feet; 35 horse breaker engine; 12 inch+2½ feet cylinder; 2½ inch rods; 2 boilers 30 inches+20 feet long; 200 feet 1¼ rope. The incline plane is 60 yards long; has 310 feet chain.

Ventilation.—The slope is a downcast air-course. Air splits at the bottom and goes in the east gangway to the fan; returns through the breasts to the upcast air-hole 20 yards from the slope, and up to the surface to the furnace stack; a door in the gangway at the second breast west of the slope; and there is another air-hole; the air draws in from the slope near the bottom by a hole in the pillar, and this air ventilates the west side; a door on the slope forces the air in this hole, and works at will in the breasts, as the gangways are wet and just stopped under the railroad, yet the ventilation is not bad. There is a slight indication of gas existing in face of the gangway.

Remarks.—I directed the removal of the stop door on the slope, and admit the air come down to both gangways and go in east and west; to cross the air over the slope by a 4 feet square box in to the upcast through the east pillar into the upcast, and by this means a correct ventilation would be effected. As the mines become extended the air-courses should be increased to effect an adequate ventilation.

Recapitulation.—3 engines of 115 horse power; 3+7 boilers, 30 inches +30 feet=300 feet; 1 slope chain 750 feet ⅝ inch, and one ditto 600 feet ditto, and the dirt plane chain 310 feet long=1,660 feet chain; 180 men and boys; 10 mules; 55 wagons; 400 yards of track, 40 inch gauge, 25lb. rail; 1,500 yards gangway; 38 breasts working; 2 pumps; 2 furnace ventilators; 4 escape roads; temperature outside, 44°; inside, 52°, 68°; air, 9 times slow; 12 per cent. acid in water; 5 ditto gas; collieries fair; capacity of shipment, 60 cars from all places. Officers: boss miner, Wm. Heart; outside, Thomas Butz; engineer, Thomas Major.

No. 88.—Saylor Colliery.

October 9, 1869.

Description.—I herewith submit a detailed description of this colliery as herein set forth. It consists of a slope sunk on the south dip of the Primrose vein, 90 yards deep, and dip 20°; section area 20+16+6=108 square feet; 2 tracks, 40 inch gauge, 25lb. rail; one 40 inch pump road and a man road. An inspection could not be effected as the gangways were partly flooded with water by heavy rains. The colliery is located at the terminus of the east branch of the Mt. Carbon railroad, a little west of Wadesville, 5 miles north of Pottsville, at Floweryfield farm. This colliery has passed through several hands. The breaker is situated 150 yards east of it, and the Centre turnpike runs 300 yards on its west. Some 80 men and boys are employed; 6 mules and 25 wagons.

Engines.—A 60 horse engine used at the slope, 14 inches+4 feet cylinder, rods $2\frac{1}{2}$ inches; a 16 feet wheel; 7 feet+10 feet drum; 9 inches+15 feet shaft; wheel shaft, 10 inches+9 feet long; one pole pump; a 12 inches +9 feet shaft; pump pinion, 8 feet, 12 inch face; 3 boilers, 30 inches+21 feet long; good grate, 52 square feet; steam on beam, 75lbs, beam stamped; 2 wire ropes, 450 feet long each, $1\frac{1}{8}$ inches diameter; the upcast shaft is 3+5+4=16 square feet; a furnace erected on it at the surface, the stack of iron, 30 inches in diameter, all of which is too small; 400 yards outside track, 40 inches gauge, 25lbs rail; 20 horse breaker engine, 12 inches+$2\frac{1}{2}$ feet cylinder, $2\frac{1}{2}$ inch rods; 12 feet fly and pulley wheel; 2 boilers, 30 inches+20 feet; 120 feet of gum belts; 6 inches+9 feet shaft; grate surface, 24 square feet; shipping capacity, 20 cars per day; 2,000 feet of gangway; 12 breasts, 30+180 feet; 16 feet pillar; outside temperature, 48°. I could not enter the mines.

No. 89.—Boston and Mahanoy Colliery.

October 12, 1869.

Description.—I herewith submit a detailed description of this colliery, as herein set forth. The colliery is located on the north side of the Mahanoy valley, opposite the new planes, six miles west of Mahanoy City, and 36 miles north of Pottsville, by rail, on the estate of the John Gilberton, late the estate of Mr. Stephen Girard, of Philadelphia. It consists of 2 slopes sunk on the south dip of the Big vein, 330 feet deep, at an angle dipping 46° south; section area, 26+24+8=208 square feet; 2 tracks, $5\frac{1}{2}$ feet gauge; one 44 inch pump and a 40 inch manroad; a cage is used to lift out the wagons; a wire rope, 430 feet+$1\frac{1}{2}$ inches is used; the slope plane is extended 30 yards above the slope mouth to the level of the engine house; the machinery and engines of which are in excellent condition; there is an immense amount of coal in this property, consisting of the Primrose vein, 12 feet thick, the Mammoth vein, 40 feet; Four-feet vein, the Seven-feet vein, the Skidmore vein, 8 feet, and the Buck mountain vein, 16 feet thick—total thickness, 87 feet; the railroad crosses over the out-crop of the vein over 5 breasts, and threatens with disaster at any moment; the railroad company employs a person to keep ward in the mines, to avoid a calamity.

Gangways.—The west gangway is in 900 yards, having 31 breasts on it; the east ditto is in 1,000 yards, and has 41 breasts on it, each 36 feet wide,

with 24 feet pillars; 4 check doors on this gangway; 2 gangways=1,900 yards.

Ventilation.—The mines are ventilated by a steam fan, 20 horse power, 14 feet fan; the air-courses in some places are crushed; the air is now brought down in the cross headings, to north side of the gangway, and along it for a distance, brought over the gangway into a main air-course to the face; the face of this gangway broke in by the pressure of water, and they are changing the course of the gangway a little north, to avoid it; the air traverses the breasts, returns to the slope and up 40 yards from it, and crosses the slope to the west, and thence up the fan outcast shaft; the fan is all exposed, and in that manner cannot ventilate as it should, though the air is good and very little gas evolves; I directed the driving of a monkey gangway to relieve the air; a downcast air-hole on the east gangway, the air of which is regulated by stop-doors, and forces the air to the face of the work, and the air here is good; the original air-courses are crushed in, but preparations are in progress under our directions, that will remedy the ventilation. Two casualties occurred in the mines this year: two men killed.

Engines.—Twenty horse fan engine, 14 feet fan, all in good order; 70 horse slope engine, 18 inches+6 feet cylinder, 14 feet wheel; 9 feet+13½ feet drum, with 12 inches lagging, 4 inch rods; 9 feet pinion, 12 inches face; 10 inches+9 feet shaft; 12 inches+16 feet shaft, all very strong; 40 horse pumping engine; 14 inches+4 feet cylinder; 14 inch pump; a 15 feet wheel, its shaft 9 inches+6 feet; a 10 feet pinion, 12 inches face, and the pump shaft is 12 inches+17½ feet, 3 inch rods; 30 horse engine breaker, 14 inches+3½ feet cylinder; 60 horse steam pump in the slope on the west side, and in the old slope which is now used for its purpose, and as a safety traveling road; its cylinder is 30 inches+4 feet stroke; 12 boilers, 34 in. +30 feet and 28 feet long=344 feet long; steam at 80lbs, beam stamped; grate surface 162 square feet; the water is very good, and all the engines, machinery and tackle, generally good; 1,000 feet 1¾ inch wire rope in use; an iron tank, capacity 1,000 cubic feet.

Remarks.—The colliery has all the veins known in the Mahanoy valley. It has 3 safety traveling roads. Not much gas or water in the mines, and as soon as the new reforms are completed the air and ventilation will be good. These mines no doubt will last for years to come. Every attention is paid to the safety of those employed.

Recapitulation.—2 slopes, each 330 feet deep; section area, 26+24+8 =208 square, and 24+20+8=176; 2 tracks; 2 pump tracks, and 2 safety tracks; 5 engines, 220 horse power; 12 boilers 344 feet long; grate surface, 162 square feet; 80 lbs steam; 2 gangways, 1,900 yards, or 5,700 feet long; 72 breasts, each 36 feet wide, 210 feet long; one vein 30 feet thick; 1,500 feet outside track, 44 inch gauge, 25lb. rail=7,200 feet of road; one 60 horse pump; 1,000 feet 1¾ rope; one saw mill, 15 horse power; limit of colliery, 1¾ miles; 240 men and boys; 16 mules; 60 wagons; round trip, 38+4=42 miles; 2 visits, 84 miles; 3 safety roads; temperature inside, 56° to 51°; outside ditto, 28°; volume of air, 6¼ times too slow; acid in water, 4 per cent.; gas in mine, 5 per cent.; condition of mine, favorable; shipping capacity, 135 cars; present ditto, 65 cars per day, by Philadelphia and Reading railroad.

No. 90.—Boston Run.

October 13, 1869.

Description.—This colliery is located on the estate of the late Messrs. Richard Kear and Burd Patterson, 3 miles west of Mahanoy City, 33 miles, by rail, north-east of Pottsville, on the south side of Mahanoy valley. This tract was formerly part of the estate of Stephen Girard. The colliery is now operated by Buck & Althouse. It consists of a drift and slope. The slope is sunk 390 feet deep, on the north dip of the Big vein, at a dip of 39°; section area, 22+20+8=168 square feet; 2 tracks, 44 inches; pump track, 48 inches, and a 40 inch safety road. The coal is 25½ feet thick, and the buildings all new and in good repair. The mines are kept in good order, and every necessary attention paid to the safety of the miners and those employed. I here found the best ventilation yet. Mr. Maingay manages the mines.

Gangways.—The old counter gangway is in 1,200 yards; the slope east gangway is in 200 yards; the west gangway is in 400 yards; the areas of these gangways are 12+6½+7⅓ feet=67¾ square feet; total length in feet is 5,400 feet—add the 2 slope tracks, each=780 feet=6,180 feet; 14 breasts, each 30 feet wide and 210 feet long; 18 feet pillars.

Steam fan ventilation. An air-hole on the west drove out to the surface, and the air in the east branch off in that gangway 20 yards from the slope pillar and south of the slope. The schutes on the breasts are closed with plank batteries, and the pillars all holed every 20 yards up their length; a door from the third air-hole in the breast and a regulating door inside on the counter gangway and opened into the dog-hole or gangway air-course, with manways in the pillars inside the first turnout; there are 2 doors on the west gangway, with spaces of 120 feet between them; the lower and counter gangways are 114 yards apart, and 6 yards of coal left as a chain pillar to support the counter gangway; air, ⅚ times slow.

Engines.—Two engines 40 horse power each, are in use at the slope, 16 inches+2½ feet cylinders, rods 3 inches in diameter; 2 drums, each 11 feet +5 feet long; 2 wheels, 14 feet by 12 inches face, in the centre of the drums; 1 shaft, 12 inches+9 feet long; ditto, 12 inches+8 feet long, and 1 ditto, 12 inches+8 feet; the machinery in good order, but the foundations are giving way; 6 boilers in 3 nests, 30 inches+36 feet=216 feet long; grate area 90 square feet; beams stamped and steam at 85lbs; a 10 horse fan engine, 8 feet diameter fan; area of paddles, 96 square feet, its shaft 6 in. +4 feet long, at 46 revolutions; 960 feet 1½ inch wire rope in use in slope; 60 horse steam pump in slope; 40 horse breaker engine, all in good condition, and a saw mill attached; 3 boilers, 30 inches+30=90 feet long.

Remarks.—The air-course must be made near the bottom slate, on the west gangway, of an area of 36 square feet, and to communicate within ten yards of the slope, as the pillar is 20 yards thick; the outcast air-hole should be drove through its centre, for safety to the upper counter gangway, and it could be used as a safety road to. I found every attention paid to the comforts of the men.

Recapitulation.—One slope and one drift slope, 390 feet deep; 2 tracks; 1 pump and 1 man road; dip 39° north; 1,470 feet 1½ inch rope; 2 visits, 67 miles; temperature inside 55°, and 45° outside; 3 gangways, 6,180 feet long; 1 plane, 80 feet; 2 tracks; 600 feet 1¼ inch rope—total ropes, 2,070 feet; 160 men; 11 mules; 45 wagons; capacity, 100 cars; 1,200 feet 25lbs and 7,380 feet 22lbs rails outside, and 420 feet chain; 4 engines, 155 horse power; 11 boilers, 358 feet long; 1 pump; 1 vein, 25½ feet thick; one 15

horse fan; air, $\frac{6}{7}$ times; 3 per cent. acid water; condition of mine good; length of the boundary line, $1\frac{3}{4}$ miles; colliery five years in operation; coal shipped by Philadelphia and Reading railroad, over the Broad Mountain planes.

No. 91.—Draper Colliery.

October 14, 1869.

Description.—This colliery is located on the south side of the Mahanoy valley, 2 miles east of the new planes, 4 west of Mahanoy City and 34 miles north-east, by rail, from Pottsville. The colliery consists of a slope 135 feet deep; section area 12+10+8=88 square feet. This slope is to be used as a pump slope after the big slope is sunk, as the present breaker is $\frac{3}{4}$ mile off, and it is to be left idle after the new breaker that is now building is completed. The coal now mined is dumped into a counter schute and hauled in the drift gangway to the present breaker. The mines are operated by Mr. William Draper. The west boundary is 700 yards off; the east, 1,300=2,000 yards of run. It is a desirable location and an unlimited amount of coal on the tract. The slope gangways are 30 yards west and 60 yards east; counter is 880 yards; some 970 yards gangway drove. Temperature, 48°, 46°, inside.

Ventilation by common air-holes, but intend to have a 15 horse fan erected in the new slope; air, $7\frac{1}{2}$ times slow.

Engines.—40 horse slope engine, 16 inch+3 feet cylinder; 3 boilers, 30+30=90 feet; 30 horse breaker engine, 16+4 feet cylinder; 3 boilers, 30+30=90 feet; grate area, 76 square feet.

Recapitulation.—20 horse saw mill, 1 boiler 30+30; in all, 3 engines=90 horse power; 7 boilers=210 feet long; an 8 feet+12 feet drum, 9 inch lagings; 930 feet $1\frac{1}{4}$ inch wire ropes; 9 inch+15 feet shaft; 7 feet pinion, 10 inch face; 12 feet wheel; 8 inch+7 feet shaft; 5 screens; 206 men and boys employed; 10 mules; 50 wagons; one visit, 70 miles; dip of slope, 40° north; shipping capacity, 50 cars; breaker capacity, 100 cars per day; coal transported over the Philadelphia and Reading railroad planes. Officers: Martin Scott, boss miner; J. W. Lewis, superintendent. No accident occurred. James Smith, engineman. 3 breasts open, 30+200 feet; 18 feet thick pillars.

No. 92.—Cleaver Colliery.

October 15, 1869.

This is a small colliery located on the eastern limits of the town of Ashland, $13\frac{1}{2}$ miles north of Pottsville, on the estate of J. P. Brock & Brother, consisting of 2 drifts; operated by James R. Cleaver & Co. A drift on the Six-foot vein, dipping 36° south; its gangway is in 800 yards; the breasts are 30 feet wide and 240 feet long; the pillars are 15 feet thick; the ventilation is by an air-hole, 100 feet west, and another 200 feet from the end of the gangway, and another constructing at the face of the gangway, which will effectually ventilate the mines. The second drift is open on the Big vein, on its south and north dip, 100 yards in; 6 breasts working; 25 men and boys employed; 5 mules; 20 wagons in use; shipping

capacity, 15 cars per day; a 15 horse breaker engine; 2 boilers, 30 inch+20 feet long; grate, $4\frac{1}{2}+6=27$ square feet surface; 600 feet outside track, 25lb. rail; the air is 8 times too slow. Officers: J. R. Cleaver, superintendent; J. P. Burk, engineman. The mine is in operation 4 years, nearly.

No. 93.—James Bowen Colliery.

October 15, 1869.

This is a new colliery adjoining the Cleaver colliery, on Little Mine run, on the estate of John P. Brock & Bro. It consists of a drift on the Eight-foot vein, running in west 500 yards, and have 4 breasts on it. It is a new mine and its present capacity will average 6 to 10 cars per day. The town is partly supplied from these mines. A 15 horse breaker engine in use; 2 boilers, 30 inches+20 feet long; 20 men and boys employed; 3 mules; 15 wagons; 1,000 feet outside track, 40 inch gauge, and 1,500 feet inside track, 40 inch gauge, of 25lb. rail. Little can at present be said of ventilation, as the air-holes are run out to the surface, and the gangways all above the water level, yet there is some gas in these veins. J. Bowen, superintendent.

No. 94.—Suffolk Colliery.

October 16, 1869.

This colliery is located east of St. Nicholas station, on the north side of the Waste House creek, 440 yards from the Ashland and Mahanoy City railroad. The colliery consists of some 5 drifts north and south of the breaker, on the estate of Dundas, Biddle & Co., and operated by the Mahanoy and Philadelphia coal company. It is situated $32\frac{1}{2}$ miles, by rail, north-east of Pottsville, and $2\frac{1}{2}$ miles north of Mahanoy City. The breaker is located on a flat in the valley, and the wagons are hoisted in a perpendicular manner to the platform, emptied and returned. There is also a steam saw mill attached to the breaker engine, by which the colliery is supplied with all needful lumber. E. J. Phillips, local member of the firm and resident superintendent.

Gangways.—No. 5 drift gangway is 7,920 feet long; No. 2 gangway is 5,400 feet long; No. 3 gangway is 2,640 feet long; No. 4 gangway is 5,280 feet long; the No. 1 gangway going south is 5,360 feet in, but now idle= in all, 26,600 feet, over 5 miles; some 32 breasts open in the mines. Ventilation is effected at present by air-holes run out to the surface; one of which is located on the Big vein, inside the tunnel mouth; and a second one, 42 yards up at the second tunnel mouth, 59 yards out to the surface, and a third one drove at the face of the gangway; a pipe conveys the air from the tunnel, and forced up into the breasts; No. 1 tunnel is in 40 yards, and has 30 yards more to go.

Remarks.—The colliery is tolerably well managed. I recommended the placing of a door on the main gangway, and to brattice the tunnel for an inlet, and return it by a brattice to the air-hole near the first tunnel, and switchback the gangway 200 yards; as this gangway rises 10° at the face, and again suddenly dips north at the face; to place a fan at No. 5 drift mouth, of a 15 horse power, make the inside air-hole on the Big vein a down-

cast air-hole, and also the inside air-hole on No. 2 drift, and let No. 5 gangway become an outcast air-course to this fan; thus all the gangways would become air-courses and dooring them at the working breasts, would force the air up into these breasts, and by the headings in the pillars, the air would communicate from breast to breast, and again come down to the gangway and out to the fan; to work up the breasts, narrow at first for the air to pass up to the top cross-heading in the pillars, and then returning back, skip off each side of these pillars to get out all the coal; to enlarge the air-holes over the saddle between No. 5 and No. 1 gangways on the switchback, the colliery would become thoroughly ventilated; no gas in any quantity is evolved, but what there is, is choke damp.

Engines.—Thirty horse breaker engine, 12 inches+2½ feet cylinder, 2¾ rods; 9 inches+8 feet shaft; 9 feet pulley, 20 inches face; 3 boilers, 30 inches+20 feet long; grate surface, 4½+8=36 square feet; driving pulley, 5 feet, 16 inches rim, running 90 feet+16 inches belt; 10 screens for separating coal.

Recapitulation.—Five drifts, 26,600 feet long+210 feet tunnels; one 30 horse engine; 3 boilers, 30+20=60; one saw mill; 158 men and boys; 27 mules; 58 wagons; one set elevators, 80 feet high; 200 feet 1½ inch wire rope; 2 veins, each 10 feet thick; east run, 1,760 yards; west run, 2,600 yards; 1,800 feet outside track, 48 inches gauge, 25lbs rail; 8 air-holes; 8 safety roads; temperature outside, 40°, ditto, inside, 56°; 67 miles travelled, 2 trips, 134 miles; total length of tracks inside and out, is 5½ miles nearly; air, 5¼ slow; water 5 per cent. acid; condition of mines good; shipping capacity, 50 cars per day. Matthew Thomson, boss miner.

No. 95.—Kaska William Colliery.

Inspected October 18, 1869.

Descriptive statement of this colliery is herewith submitted. The colliery is located one mile west of Middleport, and 11 miles by rail from Pottsville; the mines are located on the lands of Messrs. Hiester Clymer, John Van Buren and others, now leased and operated by P. D. & Dr. Luther, who are operating these mines over 24 years; it consists of three slopes, and a new drift, two of which are filled with water and abandoned, with a large amount of railroad iron and mining materials in them; the new slope is sunk on the Lewis vein, 227 feet deep, on a south dip 55°, the section area of which 15+13+7=98 square feet; the drift vein is 4 feet thick; the slope east gangway is in 300 yards; the west ditto, 300 yards=1,800 feet; there are two tracks and one pump road in the slope; a tunnel from the slope to the Little vein south, the coal of which is from 6 to 10 feet thick; the east and west gangways are 2,100 feet long, and a tunnel from the Little vein to the Skidmore vein, 60 feet long; the east and west gangways of which are 480 feet long; the 6 gangways on the new slope, are 4,380 feet long; the drift 660 feet=5,040 feet; the two slopes on the South dip of the Big vein lie one above the other, with 26 feet of parting slate between them, so that the same engine could work both slopes; their gangways exceeded 4 miles long; 7 tons of rails; 15 wagons and 2-16 inch pump; columns is covered with water. The collieries were formerly managed by Mr. Frank Daniels.

Ventilation.—The slope is a downcast and the air passes in the gangways, returns back to the tunnel through the breasts and out by the upcast air-

hole to the surface at the fan; there was not much doing at the time when I inspected these mines, and on that account the speed of the air could not be well determined.

Recapitulation.—3 slopes, one of which was operated; 50 horse engine used in the new slope; 4 boilers, 30 inches by 25 feet=100 feet; 6 gangways are=5,040 feet long; some 13 breasts are working in the mines, each 30 feet wide, 210 feet long; 1,100 feet outside track, 44 inches gauge, 25 lbs rail; 30 horse breaker engine; 3 boilers, 30 inches by 30 feet long, and a 10 horse fan. Owing to their long service the engines, boilers and machinery bear its impress; 125 men and boys are employed; 10 mules and 40 wagons; some choke-damp appears in the Skidmore gangway; 560 feet $1\frac{1}{8}$ inch wire rope; 24 miles.

No. 96.—John Johnson's Drift Colliery.

October 27, 1869.

This colliery consists of 2 drifts, south of the town of Tamaqua, operated by John Johnson. The 2 gangways are 2,400 feet long; one horse power screens the coal, which is sold in town and the balance taken to Borda's breaker; 18 men and boys employed; 2 mules, 6 wagons; distance to and from Pottsville, 35 miles; shipping capacity, 6 cars per day; intend to run it up to 15 cars per day; the drifts must be 200 feet above the water of the Little Schuylkill river; 6 breasts, 30 by 200; 16 feet pillar.

No. 97.—Kentucky Colliery.

Inspected October 29, 1869.

Description.—I herewith submit a detailed description of the above named colliery, as herein set forth. The colliery is located one mile north of Tuscarora and the Schuylkill Valley railroad, thirteen miles by rail, east of Pottsville. The colliery consists of a slope and drift. The slope is sunk on the Kentucky tract, on the south dip of the Big vein, 525 feet deep; its section area, 24 by 22 by 7=161 square feet; 4 tracks; 2 wagon; 1 pump, and 1 man road. The mines are operated by Shall & Donohœ; the location is desirable, and from the number of veins on the tract the colliery is valuable. The dip of the veins is 33°; the bottom of the slope reaches the drift level by which all the mine water passes off.

Gangways.—The Skidmore gangway is 6,000 feet in north, and a 16 yard partition slate separates it from the west ditto, which is in 9,300 feet; the east ditto is in 11,025 feet; in all three gangways, aggregate length, 26,325 feet; 3,000 feet of outside tracks, of 44 inch gauge; 1,280 feet of $1\frac{1}{4}$ inch wire rope; 180 feet 1 inch rope on the plane=1,460 feet rope; 758 feet drift tunnel.

Ventilation.—A good steam fan ventilates the mines. The air is carried on the lower side of the gangway into the faces of the gangways, and by slope doors the air is forced up into the working districts, where the miners are at work; thence returns through the heading in the pillars to the turnout; and thence by the fan outcast air-hole. The slope and tunnel are

intake air-courses; will carry a dog-hole on the gangway, and brattice thence to the fan. This done the ventilation will be good.

Engines.—A 30 horse breaker engine, 15 inches by 5 feet cylinder; 3 inch rods; 12 feet wheel; 16 inch face; 3 boilers, 30 inch by 30 feet; 70lbs steam; beam stamped; a 14 inch by 50 feet gum belt; 2 screens; a saw-mill attached to this engine; 40 horse slope engine; 16 inch by 4 feet cylinder; $3\frac{1}{2}$ inch rods; 16 feet wheel; 9 inch by 6 feet shaft; 4 boilers, 30 inches by 30 feet=120 feet; valves good; running at 107lbs steam; beams stamped; put the pressure at 90lbs, and no higher; the boilers good; 20 horse fan engine; a 14 feet fan; 6 paddles, 4 by 4=16 square feet=96 square feet section area; 70 revolutions; air shaft, 70 square feet; 20 horse saw mill; grade surface, 104 square feet; machinery all in good condition; the engines all well kept.

Remarks.—The slope is new and well constructed, and the safety roads are good through gangway, tunnels, &c.; the ventilation is good, and also the drainage; very little gas of any sort at present; some of the old gangways are under repairs, and are to be kept so; 2 veins; the Big vein has 25 feet of coal; the Skidmore vein 8 feet thick; a slant gangway, running at a 10° angle to north-east and south-east, on the Skidmore, the coal dipping each way; a large amount of coal remains in the old works; the safety of the miners is constantly receiving attention.

Recapitulation.—4 engines=110 horse power; 7 good boilers=210 feet; grate surface, 91 square feet; one visit, 25 miles; one slope, 24 by 22 by 7 =161 square feet; one drift; 100 feet inclined plane outside; 3 gangways, 26,325; tunnel, 750 feet; 200 feet track on plane; 3,000 feet track outside; total length of tracks of 44 inches gauge, 25 lb rail, is =32,279 feet T rail; one pump; 1,460 feet wire ropes, 1 and $1\frac{1}{2}$ inches; 1 twenty horse fan; 3 downcasts; 3 upcasts; 3 safety roads; temperature outside, 42°; do. inside, 52° to 46°, good; air three times slow; 1,050 feet slope tracks, 28lbs rail=31,325 feet of tracks=6 miles, nearly; shipping capacity, 50 cars per day; 210 men and boys employed; 13 mules and 45 wagons in use; 5 per cent. acid in water; general condition good; 10 breasts, 240 feet long, 30 feet wide; 21 feet pillars; area of upcast, 40 feet; the slope is sunk to the water level only; 2 feet Bk. Band iron ore in the tunnel.

No. 98.—Swift Creek Colliery.

Inspected November 1, 1869.

Description.—I herewith submit a detailed statement of this colliery, as herein set forth. The colliery is located west of Tuscarora one mile, and 11 miles by rail east of Pottsville; the colliery is a new slope, just sunk on the South dip of the Holmes vein, 330 feet deep, at an angle of 65° dip; 4 tracks; 2 road tracks, one pump ditto, and one safety road; the colliery is sunk on the estate of Gideon Bast, Davis Pearson & Co., and operated by Messrs. Van Winkle & Desocarrez; the gangways are just turned, and in all appearances the colliery will become a good one, as the vein and coal look favorable; the premises are all new and well adapted for business; only a few miners were then at work, with very little indication of gas.

Gangways.—100 yards east and west=200 yards.

Ventilation.—An air-hole is driving in the centre of the slope pillar east side; its area 36 square feet; the west side air-hole is 15 yards from the

slope of an equal area, and the fan air shaft will be double the area of both; the slope is a downcast intake, and the air will be carried along the gangways to the face, returned by check doors on the gangway to force it up into the breasts through the headings, and down into the fan air-courses, and out by the steam fan to the surface; this is a correct principle.

Engines.—25 horse breaker engine, 14 inches+2 feet cylinder; a saw mill run by its power and machinery; 3 gum belts, 190 feet long; 8 boilers in 3 nests, 34 inches+30 feet=240 feet long; 120 horse slope engine, 17½ in. +6½ feet cylinder, 3½ inch rods; beams not stamped; steam at 80lbs; 20 feet fly wheel; shaft, 12 inches+8 feet; 11 feet by 13 feet drum; 12 inches by 14 feet shaft; 8 and 7 feet pinions; 560 feet 1¼ inch chains in slope; 2 sheaves, 7 feet diameter; 4 inch grooves.

Remarks.—The mines will be ventilated properly, after a 20 horse power steam fan is erected; there is every precaution taken to insure the safety of the miners, &c., and a safe ventilation of the mines; the engines, boilers and machinery all of the best workmanship, and the necessary arrangements making to lower and raise out the miners.

Recapitulation.—A slope 330 feet deep; section area, 22+20+8=168 square feet; dip, 65° south; 2 gangways, 200 yards=600 feet; none killed or injured; one visit, 28 miles; breasts, 30 feet wide, 210 feet long; 24 feet pillars; one vein at present, 10 feet thick; 2 engines, 145 horse power; 8 boilers, 34 inches+30 feet=240 feet long; 80 lbs steam; water good; 1 pump; 560 feet chain; 20 horse saw mill; 43 men and boys employed; 5 mules; 8 wagons; 9 months in operation from start; temperature, 41° outside, 52° inside; condition, good; capacity, 10 cars per day; inside track, 600 feet; 2 slope tracks, 1,120 feet; outside ditto, 1,300 feet; in all, 3,020 feet, 44 inch gauge, 25lb rail. Officers: M. Segeretz, superintendent.

No 99.—Peach Orchard Swamp Colliery.

Inspected November 2, 1869.

This is a new slope on the above tract, and is in the act of sinking by Mr. Rowbotham, 1½ miles west of Tuscarora, ¼ mile from the Valley railroad, and 13 miles, by rail, from Pottsville. The slope is sinking on the south dip of the Holmes vein, on a 65° dip; 2 tracks, 44 inch gauge; 40 inch pump track; section area, 18 by 13 by 6=90 square feet; 10 horse pumping engine; 3 boilers, 34 inches by 20; grate surface, 32 square feet; 16 feet wheel; 10 inch by 7 feet shaft; 7 feet by 10 feet drum; 9 inch by 16 feet pump shaft; 260 feet 1¼ inch wire ropes; 200 feet slope tracks; 180 ditto outside tracks, 44 inch, 25lb; 40 horse slope engine, 15 inch by 4 feet cylinder. Wm. Gibson, boss miner. It is suppssed that this slope will reach the basin of the Holmes vein at 330 feet deep, at the angle of 65°; that this slope will be hereafter used as a pump slope, and a larger coal slope sunk for mining purposes, the new one drove up as a breast to the surface, which will greatly curtail expenditures in slope sinking matters, and enable the firm to complete the work sooner.

No. 100.—Knickerbocker Colliery.

Inspected November 3, 1869.

Description.—This colliery is located on the east of St. Nicholas $\frac{1}{4}$ mile, and $32\frac{1}{2}$ miles north-east of Pottsville, by rail. It consists of five drifts. The breaker is located on a flat near the Waste House run, on the lands of the Knickerbocker coal company, and by them operated; the coal sent by the Philadelphia and Reading railroad planes. The original name of the company was the Philadelphia and Mahanoy coal company. Mr. Phillips is resident member and agent. The coal of the five veins is 65 feet thick.

Drifts.—No. 1 has two gangways on the Mammoth vein; coal, 25 feet thick; dips north 23°, and runs in 3,600 feet; breasts, 30 feet wide and 228 feet long. No. 3 drift dips 23°; 2 gangways are 8,600 feet in. The other drifts are idle. In all 4 gangways=12,200 feet. 28 breasts working. The pillars are 20 feet thick.

Ventilation.—A 6 horse steam fan ventilates these mines; the air is carried by a dog-hole 50 yards from the fan of No. 1 drift by a brattice, and thence by a dog-hole on the gangway to near the fan. This ventilation greatly depends on the action of the atmosphere, as the fan is not located to advantage, and want of check doors, and leakage; wants 36 square feet air-course and put the fan on No. 1 drift.

Engines.—A 50 horse engine hoists the coal from the level at the breaker, and also breaks it and screens it, and also runs a saw mill; 3 boilers, 34 inches+36 feet long. These boilers are patched, but considered safe for some time to come; grate surface, 38 square feet.

Recapitulation.—4 gangways, 12,200 feet long; 2,400 feet outside track; in all, 14,600 feet track, 48 inch, 25lb. rail; 240 feet incline plane, 2 tracks; 50 horse engine; 3 boilers, 34 inches+36 feet=108 feet; grate surface, 36 square feet; 500 feet 1 inch rope; 175 men and boys; 19 mules; 51 wagons; 54+4=58 miles traveled; one 6 horse fan; 6 safety roads; temperature, 43° outside; ditto inside, 56°; air, 13 times slow; 5 per cent. acid in water; no gas in a body; condition of mines, favorable; shipping capacity, 60 cars per day—could prepare 100 cars a day.

No. 101.—Barry Slope Colliery.

Inspected November 4, 1869.

Description.—This colliery consists of a slope sunk on the south dip of the Primrose vein, 285 feet deep, having two tracks, 44 inches and 48 inches pump track, and a 44 inch safety man-road, and another independent traveling road east of the slope, the area of which is 22+20+7=147 square feet; it is situated midway from the cities of Shenandoah and Mahanoy, two miles from each, and 35 miles by rail from Pottsville, on the estate of M'Neill coal company, and operated by them. The coal from this colliery is transported over the Quakake railroad; the coal is washed here by water pumped from the slope for a double purpose, i. e., coal washing and draining the mines.

Gangways.—Two gangways, 7,600 feet long; over two miles of drifts worked out and abandoned; the coal dips 45° south.

Ventilation by furnaces, the grate area of which is only 3×4 feet=12 square feet, and the section area of the air courses 3+$2\frac{1}{2}$ and 3+3 square

feet=9 and $7\frac{1}{2}$ square feet section, which is inadequate to ventilate; there is much smoke and some choke-damp in these mines. I recommended the enlargement of the air-courses and the substitution of a steam fan.

Engines.—A 60 horse slope engine, 16 inches by 6 feet cylinder; 4 inch rods; 4 boilers, all new, 36 inches by 30 feet long=120 feet; grate surface, 5+14=70 square feet; steam at 95 pounds; the beams not stamped; 7 feet by 10 feet drum; $20\frac{1}{3}$ feet wheel; 2 six feet pinion wheels, 12 inch face; 12 inches by 8 feet shaft and a 10 inches by 14 feet ditto; pump ditto, 12 inches by 16 feet; one 14 inch column; a 40 horse breaker engine breaks and hoists the coal; 240 feet inclined plane; two 44 inch tracks; 600 feet 1 inch wire rope in use on plane, and 700 feet $1\frac{1}{4}$ inch do. in use at the slope; in all 1,300 feet; 3 boilers, 36 inches by 30 feet=90 feet long; area of grate, 45 square feet; 14 feet wheel, 30 inch face; 10 inches by 8 feet shaft, running 300 feet of belting.

Remarks.—I recommended the substitution of a 15 horse steam fan for the proper ventilation of these mines as the air now was found to be nine times slow, and much smoke remaining in the mines; all the air-courses enlarged to an area of 36 square feet, and the steam fan out-cast air-shaft to be double the area of both the east and west air-holes together, as it will eventually need it to increase the pillar heading of a like area and keep a main heading at top of all the breasts as a chain air-course, with plank batteries on the schutes and canvasses on the draw-holes; this done there cannot be any cause of complaint.

Recapitulation.—One slope, 285 feet deep, 4 tracks; area, 22+20+7=147 square feet; three veins, 42 feet thick; 2 engines, 100 horse power; 7 boilers, 36 inches+30 feet=210 feet long; 115 square feet grate surface; 1 incline plane, 240 feet; 125 men and boys; 6 mules; 40 wagons; 7,600 feet of 44 inch gauge tracks, 25lbs rail; 1 pump column, 14 inch; 1,300 feet wire rope; one furnace; 2 safety tracks; air, 9 times slow; temperature, 44° outside and 54° inside; difference, 10°—snow; condition of mines, favorable as to strength and regularity; one visit, 70 miles; 16 breasts, each 30 feet+200 ditto; the pillars 20 feet thick; shipping capacity, 80 cars, and at present 50 cars per day.

No. 102.—M'Neill's Colliery.

Inspected November 5, 1869.

Description.—This colliery is located two miles east of St. Nicholas station on the Ashland and Mahanoy railroad, and midway between Shanandoah City and Mahanoy City, on the estate of M'Neil coal company, and 34 miles, by rail, north-east of Pottsville; operated by the M'Neal coal company. The colliery consists of three drifts and a new slope, which they are sinking on the Big vein, some 120 feet deep on a 15° dip, having one 6 feet track, a 4 feet pump track and a safety road. On the north drift a slope 60 feet deep is sunk, and the drift or tunnel is continued until the coal is touched; then east and west gangways are open. A 60 horse steam pump in the slope will both drain it and the water will be used to wash the coal with. A tunnel runs south to the Skidmore vein, with east and west gangways open thereon. The coal is transported over the Lehigh Valley railroad to New York.

Gangways.—The west gangway in the tunnel is 1,350 feet in; the east ditto 810 feet in, and the vein dip 38° south; 8 breasts, 8 yards wide, 210

feet long; 15 feet thick pillars. No. 2 drift gangways is 7,800 feet in; the west gangway is 1,200 feet in; the tunnel from the slope is 225 feet long, and 135 feet from the slope to the north gangway; the length of tracks inside is 11,470 feet and 18 breasts.

Ventilation.—By air-courses, $2+2\frac{1}{2}=5$ square feet; 50 yards from the slope, an air-hole is run out to the surface; the air-course passes in along the gangway, and thence into a dog-hole along the lower side of the gangway to its terminus; here the air is forced into the third breast from the fan, and up 72 yards to the top; the section area of this air-course is 30 square feet; another air-hole on the North vein 72 yards up in a heading in the pillar, 40 yards from F gangway and cross-holed from this air-couse on the bottom of the Big vein or N. vein; I found very little gas of any sort in these mines; the temperature outside at 42°, ditto inside at 52°, difference 10°; I recommended the adoption of a steam fan when the slope would be put in operation, so as to effect a perfect ventilation.

Engines.—A 40 horse engine at the breaker; 3 boilers, 34+30 feet, with a saw mill attached; the premises good.

Recapitulation.—One slope 120 feet deep, section area 18+14+12=192 square feet; 3 tracks; 5 drift gangways and a counter gangway which is 1,500 feet long; will make 12,970 feet track; 3 engines; 140 horse breaker and saw mill engine; 3 boilers, 34 inches+30 feet=90 feet; 5 veins, 57 feet thick of coal; 5 air-holes; 9 boilers, 34 inches+30 feet=270; 170 men and boys employed; 16 mules; 40 wagons; capacity of shipments, 100 cars per day; temperature outside 42°, ditto inside 52°, difference 10°; air 7 times slow; condition of mines favorable; every effort is making to fulfill the requirements of the mining law and protect the miners' lives; the tenant or miners' houses are comfortable, and hear no complaints whatever of the management of the mines, &c.; 100 feet incline plane; 150 feet rope; 1,200 feet outside tracks.

No. 103.—M'Neill's No. 1 Breaker.

Inspected November 5, 1869.

This colliery, known as the Jackson colliery, is in close proximity to M'Neill's No. 2 breaker. It consists of 2 drifts on the Skidmore and Fourfoot veins, and a new shaft partly sunk and close to the breaker, that will, when finished, deliver the coal at the breaker without any horse power as it is within some 80 feet of the buildings; at present the work on it is suspended. 2 gangways are 1,200 feet in, and not much doing therein.

Ventilation.—The North vein or Mammoth vein dips south 23°. This gangway is in a long way. The air-hole is 1,500 feet from the outside door, and another door stands at this air-course on the gangway. The section area of the air-course is 30 square feet, and the outside area is 16 square feet; this is 600 feet from the terminus of the gangway; a dog-hole is open 90 feet from the face of this gangway, and carried in along with, and a little ahead of it, which dog-hole can be pierced through from the gangway at any time that a supply of air is needed, and closing the other last cross-holes; this dog-hole is six feet wide, and will give an area of 30 square feet; there is too much smoke in this part of the mine for the present system of ventilation to effect a full supply of pure air, having its chief dependence on the atmosphere; outside temperature, 41°; ditto inside, 57°; difference, 16°.

Engines.—A 40 horse engine, 15 inch+4 feet cylinder; 3 inch rods; 9 inch+9 feet shaft; 16 feet wheel, 30 inch face; 300 feet of 16 and 12 inch gum beltings; 3 boilers, 36 inches+26 feet=78 feet long; 40 square feet grate service; steam at 80lbs; beam not stamped; 40 horse engine at No. 2; a 15 horse engine with two boilers, 30 inches+30 feet; 240 feet $1\frac{1}{4}$ inch wire ropes in use on the plane, which is 120 feet long.

Remarks.—The Barry slope colliery, the Jackson and M'Neill's collieries are all operated by the M'Neill company, and whilst the coal from the Barry colliery is shipped by the Lehigh Valley railroad, the coal from Nos. 1 and 2 breakers is shipped by the Philadelphia and Reading railroad branch road, and it now is a consolidated coal company.

Recapitulation.—2 drift gangways, 1,200 yards long; some 26,480 feet of outside tracks—nearly $5\frac{1}{4}$ miles; 3 engines=95 horse power; 9 boilers, 34 inches+30=270 feet long; grate surface, 110 square feet; steam at 80 lbs; 100 men and boys embloyed; 15 mules; 45 wagons; one visit, 70 miles; 240 feet $1\frac{1}{4}$ inch rope; shaft, 90 feet deep; area, 18+14+7=112 square feet; 5 mules in this slope; a 15 horse engine; 2 boilers, 30 inches +30 feet. John Allerton, mining boss. The works stood idle at the time.

No. 104.—Silliman Colliery.

Inspected November 9, 1869.

This colliery is located on the Dundas, Biddle, Troutman & Co.'s land, on the northern limits of Mahanoy City, $30\frac{1}{2}$ miles, by rail, from Pottsville; leased and operated by E. S. Silliman. The colliery consists of 6 drift gangways, all running west and above the water level, some of which are made on the third lift of the veins, owing to the height of the mountain. Mr. Silliman is sinking a new slope very near his present breaker, which will add greatly to the shipping capacity of the colliery next season. The privilege of working these veins eastward under the Boylen colliery is granted to Mr. Silliman, which will give this colliery a run of $2\frac{3}{4}$ miles eastward and over a mile westward.

Gangways.—The upper gangway on the Seven-foot vein is 3,396 feet in and a branch gangway in the same, 2,280 feet long; the lower level gangway on this vein is 1,650 feet long; the upper ditto on the Skidmore vein is 1,350 feet long; the middle ditto, 1,650 feet long; the lower level gangway on the same is 2,100 feet in; in all 6 gangways=12,426 feet; area of section, 10+6+8=64 square feet; some 12 breasts, 30 feet wide, 200 feet long; 15 yard pillars.

Ventilation.—The lower level gangways are intakes; in No. 18 breast an air-hole is run into the middle level gangway; the air is made to pass thence into the third level and out to the surface; a furnace will be erected on the Seven-foot vein 550 feet further west than the face of the upper gangway, the section area of which to be 60 square feet, set in solid masonry; no steam fan ventilation at present, but the air is made to pass from the lower to the upper levels under the influence of doors on the gangways and atmospheric action; no great danger is apprehended from gas in these drifts; there are several air-holes out to the surface; the miners don't complain of any bad air or gas.

Engines.—One 50 horse breaker engine; 14 inches+$4\frac{1}{2}$ feet cylinder; 3 inch rods; 16 feet fly-wheel; 2 boilers, 30 inches+20 feet long; 300 feet

long dirt plane; the coal plane 240 feet long; 550 feet $1\frac{1}{8}$ inch wire ropes used; grate surface, 29 square feet.

Remarks.—I found no complaints amongst the miners about bad or insufficient ventilation. James O'Brien was killed accidentally by being struck by a piece of coal thrown from a blast, at the distance of 42 yards, whilst standing in the gangway at that distance, as he thought out of all danger; the colliery is in operation some eight years.

Recapitulation.—6 drift gangways, 12,426 feet long; 12 breasts, 30 feet, 210 feet long; 15 feet pillars; 5 air-holes; a 50 horse engine; 3 boilers, 30 +20; 5 veins, only 2 working; coal 30 to 57 feet thick; 110 men and boys employed; 10 mules, 30 wagons; outside tracks, 1,000 feet—in all 13,426, of 44 inch track, 25lbs rail; veins dip southwardly 20°, and as they ascend the mountain they flatten out, and suddenly dip north from 50° to 70°; distance 66 miles; 70° inside, 62° outside; air 9 times slow; capacity, 80 cars a day.

No. 105.—Boylen's Colliery.

Inspected November 10, 1869.

Description.—This colliery is located one mile north of Mahanoy City, and 31 miles north-east, by rail, from Pottsville. The colliery consists of a slope and drift gangways, sunk on the Dundas, Biddle & Co.'s estates, on the south dip of the Mammoth vein, 330 yards deep; section area, 20+18 +18=152 square feet; the tract runs 2,600 yards east; the colliery is operated by Boylen & Co.; is in operation some eight years; the coal is generally shipped by the Quakake railroad, or it may be sent by the Philadelphia and Reading railroad.

Gangways.—Skidmore gangway is 2,550 feet; 776 yards from the Skidmore drift a 62 yard tunnel is drove north to the Seven-foot vein, on which there is 1,224 feet of a gangway; there is also a back switch gangway drove in it in the counter level gangway of 360 feet long to recover the coal in that district of the mine, the breasts of which dip north and south: the south breasts over-lap the gangway of Whittaker & Co.'s colliery; the Skidmore counter gangway is 3,900 feet long; the slant gangway is 390 feet in; the tunnel and 6 gangways are=9,386 feet long.

Ventilation is effected by air-holes; no furnace or fan used; a door near the tunnel on the Skidmore gangway forces the air through an air-hole at the door up into the counter-gangway; this air passes into the face, returning through the breasts and airing these works; the air-hole is in the 45th breast, on the Skidmore gangway; this air drifts about at will; there are 8 air-holes in the mines, but some of which are useless, as they get partly filled with debris and get clogged; a new air-hole is driving now at the face of the Skidmore gangway, which is expected to relieve a little, but this system of ventilation is a bad policy to get good work done, and it is more expensive in the end. I have recommended a 15 horse steam fan to ventilate the mine properly.

Engines.—A 15 horse coal plane engine; 10 inches+3 feet cylinder; 3 feet+8 feet long drum; 13 feet wheel; 6 inches+6 feet wheel shaft; 8 inches +16 feet drum shaft; 1 boiler, 30 inches+24 feet long; 60lbs steam; 25 horse breaker engine; 12 feet wheel, 18 inches face for a belt; 2 boilers, 30 inches+24 feet long, 76lbs steam, beam stamped; a 15 horse slope engine, 12+36 inches cylinder; 14 feet wheel; 5 feet+8 feet drum; shaft,

6 inches+5 feet, and an 8 inch+16 feet do.; slope, 990 feet deep, section area, 18+14+8=128 square feet; 36° dip south; 2 tracks; 1 pump road and a manroad; 2 boilers idle, 30+24 feet; 3 engines, 55 horse power; 5 boilers, 30 inches+24 feet long=120 feet long; grate surface, 72 square feet; 360 feet 1 inch wire rope in use on the coal plane.

Remarks.—No west gangways can be worked in these mines, as the railroad along the western line limits the run westward, and a title to Silliman, giving him a right to drive east gangways under their present lower levels; the air could not be measured in the mines for want of an air-current; as its movements depend on atmospheric influence, much smoke prevails in all parts of the mines; a steam fan would be of good benefit to the proper working of the mine; as at present, the miners are seriously suffering for want of good air.

Recapitulation.—One slope, 990 feet deep, 18+14+8=128 square feet; 3 tracks, 44 in. gauge; 25lbs rail; 9,386 feet in; 6 gangways; 12 breasts, 30 feet wide, 200 feet long; 3 engines=55 horse power; 5 boilers, 120 feet long; 72 feet grate surface; 100 feet plane; 360 feet 1 inch rope; 500 feet outside tracks—total length of tracks=9,868 feet; 1 pump, 6 in. column; 6 air-holes; 1 saw mill; 100 men and boys employed; 9 mules; 40 wagons; 5 veins coal, 43 feet thick. Injured, Frank Quinn, by a fall of coal. Temperature, 52°, inside ditto, 60°, difference 8°; distance, 31 miles; 1 visit, 65 miles; air, still; water, 7 per cent. of acid; capacity, 50 cars per day; a transcript map of the colliery called for, in order to establish a location for the steam fan ventilator, &c.

No. 106.—East Mahanoy Colliery.

November 11, 1869.

Description.—This colliery is located on the Delano tract, two miles north of Mahanoy City and thirty-two miles by rail from Pottsville; the colliery consists of three drifts on the east side of the Quakake railroad; the colliery is now operated by Messrs. Focht & Whittaker; Wm. R. Williams local member and superintendent; the coal is transported over the Quakake railroad; the drift on the Seven-foot vein runs in nearly a mile; 2,040 feet from the drift mouth a tunnel is drove west 14 feet to the splice gangway, which runs parallel with the main gangway, and only 14 feet separating slate divides the two veins or twin veins; the coal is very good.

Gangways.—20 breasts, each 30 feet wide, 210 feet long, are working on this gangway, area of which are $10+8+7\frac{1}{2}=66\frac{1}{2}$ square feet; lower level gangway is in 1,750 yards, 1,000 yards to run; the middle counter gangway is in 3,000 feet, and has 1,750 feet to go to the line; the upper level gangway is in 4,500 feet; aggregate length of 3 gangways is 9,220 feet.

Ventilation.—No fan or furnace used. The first air-hole is 1,550 feet from the drift mouth, and is drove up 72 yards; the air-hole is 16 square feet, (area of section;) the vein dips 17° south; the air passes in by the tunnel to the splice gangway, and conducted thence to the face by an 18 inch square box. This gangway is poorly aired, yet very little smoke prevails; the headings are holed in the pillars every 25 yards up, and a main heading runs along the tops of the breasts. I measured the speed of the air and found it three times slow; the outside temperature 44°, inside do., 52°—difference 8°; these five air-holes run out to the surface; the drifts are some 60 feet above the water level.

Engines.—A 40 horse breaker engine, 16 inch+3 feet cylinder; 12 feet wheel; 2 boilers, 30 inches+30 feet long; grate area, 26 square feet; 9 inch+10 feet shaft; 2,242 feet $1\frac{1}{8}$ inch wire rope; 7 feet+7 feet long drum; 150 feet plane, 15° pitch; 8 gum belts, 431 feet long. The machinery is all good.

Remarks.—Owing to the drifts being so very high and the flat surface of the land, the veins do not dip more than 17°; this accounts in a measure for the air being so free from smoke; whereas, if they pitched more rapid, there would be districts in the high breast that would counteract on the draft; the roof being always near the gangway and the air-holes numerous, in cold weather the warm air in the mine passes off rapidly by the air-holes, and the surface being level and the forest still standing, shelters the draft in the air-holes to a certain degree.

Recapitulation.—3 drift gangways=9,220 feet long; 20 breasts, 30 feet wide and 210 feet high; 15 feet pillars; one 40 horse engine; 3 boilers, 30 inches+30 feet long; 1 incline plane, 150 feet long, 2 tracks; 6,000 feet outside tracks, 44 inch gauge, 25lb. rail—in all=15,520 feet of track; 2,242 feet $1\frac{1}{8}$ inch wire rope; 125 men and boys employed; 13 mules; 47 wagons; 5 safety roads; inside temperature, 44°; outside, 52°; difference, 8°; air, 3 times slow; 5 per cent. acid in water; condition of mines, favorable; no fan or furnace; very little choak-damp; two visits, 131 miles; coal, 43 feet thick.

No. 107.—Copely Colliery.

Inspected November 12, 1869.

Description.—This colliery is located on a tract of land belonging to Stephenson & Co., of Philadelphia; leased and operated by Lentz, Bowman & Co.; Wm. Cowley, mining boss, and L. S. Bowman, superintendent. The colliery is situated $2\frac{1}{2}$ miles north of Mahanoy City, and $32\frac{1}{2}$, by rail, from Pottsville. The breaker is located near Quakake railroad, on the south side of the valley. The coal is shipped to Mauch Chunk, 40 miles distant. The eastern limits of the tract runs 2,600 yards, and the western run terminates at the railroad near the breaker. There are 5 veins on the tract, the Seven-foot vein and Buck Mountain veins; the other 3 veins are just drifted on to determine their position. The Buck Mountain drift is is 400 yards north of the breaker, and the gangway is in 2,700 feet, and in its course takes the following course: first east to south-east, to south, to west, and finally leads off south. The breasts are open on the left or east side of the gangway. The wagons are run in to most of the breasts, the coal being from 14 to 20 feet thick. 3 slant gangways open into different parts of the mine, on the main gangway, some 1,500 feet long, with good air-holes all along their course, with cross-holes drove at proper intervals from gangway to gangway.

Ventilation.—A grate furnace ventilates this gangway of an area of 20 square feet, and well walled up and covered with sheet-iron roof; the air being measured in a proper district of the mines and found to be $3\frac{1}{2}$ times slow; some breasts run in 900 feet, and there is 20 feet between the counter and lower gangways.

Remarks.—I recommended the pillars to be headed oftener and the air-holes made larger, and other necessary changes that would assist ventilation.

Engines.—A 15 horse runs the breaker; 2 boilers, 30+20 feet. The company intends to build a new breaker soon.

Recapitulation.—3 drift gangways, 2,700 feet long; 3,000 feet outside track; one 15 horse engine; 2 boilers, 30 inches+20 feet; 5 veins coal, 47 feet thick; 48 inch gauge tracks, 25 lbs. rail; 3 slant gangways=3,300 feet long; total length of track laid, 9,000 feet; 167 men and boys; 12 mules, 40 wagons; temperature inside, 54°; do. outside, 50°; condition of mines favorable; a map called for; not yet finished.

No. 108.—Sherman Colliery.

Inspected November 13, 1869.

Description.—This colliery is located three miles north-east of Mahanoy City and 33 miles by rail from Pottsville. Is consists of a slope sunk on the South dip of the Mammoth vein, 285 feet deep, on an angle of 65° dip; section area 24+20+8=176 square feet, with 2 tracks, 48 inches gauge, and 2 pump tracks. The land is belonging to the Delano tract, operated by Eschelman & Co. William Bishop, boss miner, Frank Carter, C. E., for the Delano estate. The slope is extended by trestle work, 180 feet high, on the same plane with the slope, which is on a level with the breaker platform; the coal is emptied by a self-acting car into the breaker schute; it is supposed the Seven-feet vein is spliced into the Mammoth vein at this colliery, the coal of which is 16 feet thick; a 40 feet cross-hole south, proved a Seven-feet vein; the east gangway runs in 1,350 feet, to where it becomes completely cut off by a perpendicular rock; a cross-hole is now driving around the rock to prove its size, which proves the vein still continues its eastward course; the pump is 40 feet east of the slope and 36 feet deep; a pole pump of a 16 inch column and a 16 inch cylinder; 21 feet pillar supports the air-hole.

Gangways.—The east gangway is in 1,350 feet; the west ditto, 1,320 feet=2,670 feet, and each having a run east and west of 2,640 feet.

Ventilation.—An air-hole 650 feet from the slope on the east side, with a furnace in it, which struggles to ventilate that district of the mine; 620 feet from the face of the west gangway, there is another air-hole and runs up 85 yards to the surface; I measured the air and found it 19½° slow; very little gas evolved.

Engines.—90 horse, 18 inches+6 feet cylinder, 4 inch rods; 18 feet wheel; shaft, 12 inches+9 feet; pump ditto, 12 inches+14 feet; drum do., 10 inches+12 feet; 10 feet+13 feet drum; 13 feet pinion on drum and 14 inch face; 35 horse breaker engine, 15 in.+3 feet cylinder; 14 feet wheel; 22 inch fan; 200 feet of 14 inch belt; 4 new boilers, 34 inches+35 feet long; grate surface, 76 square feet; 80lbs steam; beams stamped; a saw mill attached to engine.

Remarks.—I think the breasts should be worked differently, and a fan substituted for these air-holes as there will be a large body of powder smoke floating in the mines whilst this slow manner of ventilation is continued. There is a good traveling safety road 20 yards from the slope on the west side out to the surface, and the condition of the mine is favorable, except 200 feet of the east gangway is crushing badly.

Recapitulation.—2 gangways, 2,670 feet long; 1 slope, 285 feet deep, area 24+20+8=176 square feet; 4 tracks, 48 inches gauge; 2 air hole furnaces; 2 engines, 125 horse power; 4 boilers, 34 inches+35 feet=140 feet long; 760 square feet area of grate; 80 lbs. steam; 1,200 feet 1⅜ inch wire rope; 1,100 feet outside tracks, 48 inches gauge=3,770 feet T rails, 25 lbs.; one

visit, 70 miles; temperature, 50° outside; do. inside, 54°; one 14 inch pole pump; 70 men and boys employed; 5 mules, 26 wagons; mines four years in operation; air 19½ times slow; shipping capacity, 40 cars per day.

No. 109.—Trenton Colliery.

Inspected November 16, 1869.

Description.—This colliery is located on the estate of the Delano coal company, leased and operated by the Mercer coal company, situated four miles north-east of Mahanoy City and thirty-four miles by rail from Pottsville, approached by the Lehigh Valley railroad. The slope is sunk on the north dip of the Buck Mountain vein 266 feet deep, 33° dip; section area, 20+16+7=112 feet; 2 tracks, 48 inches gauge; one pump track and a safety road. The mines were temporarily idle at the time of my inspection. Joseph Calloway is mining boss at this colliery.

Gangways.—The east gangway is in 1,200 feet; no timber needed. The west do. is in 135 feet; the grade of the slope will admit mules to travel down all the way; 20 breasts working on the colliery, each 30 feet wide and 200 feet long and 18 yards pillar; the appearance of the mines is favorable.

Ventilation.—An air-hole is drove out in No. 13 breast, on the lower side of the gangway, and the air is carried by this to the face, and there forced up into the breasts, and returns by the cross-headings in the pillars to the outcast air-hole. I measured the air and found it 22 times slow; should the miners be at work no doubt the place would be filled with smoke. I found no person belonging to the colliery on the premises, but the engineer.

Engines.—A 50 horse slope engine, 15 inch+4 feet cylinder; 14 feet wheel; 12 inch+8 feet shaft; 8 feet+8 feet drum; 10 inch+12 feet shaft; 7 feet pinion wheel, 9 inch face. Three boilers, 34 inch+30 feet long; grate area 40 square feet. A 20 horse steam pump in the slope; 8 inch cylinder and 6 inch column; receives steam from the slope boilers. Forty horse breaker engine, and a 6 horse feed pump; 15 inch+3 feet cylinder; 2½ inch rods; 12 feet wheel, 30 inch face; 6 inch+6 feet drum; 3 mitre wheels, cone gearing; 8 inch+14 feet shaft; pinion shaft 9 inch+7 feet, and another 4½ inches+8 feet long; 250 feet 1⅛ inch wire rope in use at the breaker, and the slope rope is each 378 feet=756 1½ inch; 3 boilers, 34 inches+30 feet long; grate area, 42 square feet, all of which is in good order and condition.

The ventilation is bad but the whole colliery is favorable.

Recapitulation.—A slope, 266 feet deep; dip 33° north; area section, 20+18+7=112 square feet; 4 tracks, 48 inches gauge; 2 gangways, 1,335 feet long; 2 air-holes; 3 engines, 110 horse power; 6 boilers, 180 feet long; 1 slope pump; 1 saw mill; 20 breasts; 1,005 feet wire ropes; killed or injured, none; one visit, 70 miles; one vein, 16 feet thick; outside track, 1,200 feet; total track, 2,535 feet; one 6 inch pump; 65 employees; 4 mules, 24 wagons; air 19 times slow; mines damp; condition promising; 4 years in operation; shipping capacity, 15 cars per day; coal shipped by the Lehigh Valley railroad; the premises are in very good condition and of ample facilities to do a large amount of business.

No. 110.—Grant Colliery.

Inspected November 17, 1869.

This colliery is located 2 miles east of Mahanoy City, near the Mahanoy tunnel, north of the railroad, and 28 miles, by rail, from Pottsville. The colliery consists of a drift drove north on the Delano tract to the Buck Mountain vein. The mines are operated by Messrs. Eschelman & Patterson. The drift is 90 feet higher than the water level. The west gangway is drove nearly in semi-circular courses and nearly lost, owing to the strange changes in the rocky formation. So, also, the east gangway is a little out of course from E. 12° N. A slant gangway drove in 20 feet of coal to prove the incline axis of the vein as she dips north. East gangway 1,550 feet; the west ditto, 600 feet; the slant ditto, 500 feet=2,650 feet. The 8 breasts are 10 yards wide and 180 feet long; the pillars, 15 feet thick. Ventilation by air-holes, one of which is at the face of the west gangway, runs out at 60 yards to the surface. Very much smoke remains here, but no gas of any account, and an air-hole drove north on the east gangway and into the counter gangway, airs it and passes out by the outcast air-hole to the surface. Air, 11½ times slow.

A 25 horse breaker engine, 12 inch+2½ feet cylinder; 2 boilers, 30 inches +24 feet long; grate surface, 28 feet; 60lbs steam; 4 screens; 5 belts, 268 feet long. The colliery is in operation 5 years. Capacity, 40 cars per day. A furnace ventilation; area of air-course, 36 square feet; 60 men and boys employed; 5 mules and 19 wagons; John Wilcocks, boss miner; 5 veins; the Seven-foot vein, the Mammoth, 20 feet; the Skidmore, 7; the Four-foot vein and the Buck Mountain vein, 14 feet thick—52 feet thick; 700 feet outside tracks, 44 inch gauge, 25lb. rail.

No. 111.—Union Colliery.

Inspected November 23, 1869.

Description.—I herewith submit a detailed statement of the above colliery as herein set forth. This colliery is located on the estate of John P. Brock & Bro., of Philadelphia, at Big Mine run, 2 miles east of Ashland and 15 miles, by pike, from Pottsville; approached by both the Mine Hill and Ashland and Broad Mountain railroads. The mine is operated by Emanuel Bast. It consists of a slope and drifts. The slope is sunk 2 lifts =822 feet; section area, 24+20+8=176 square feet, and 150 feet more from the slope to the engine house—the total depth is 972 feet; 4 tracks throughout to the bottom; the lower lift is new; with east gangway, 381 feet, and the west ditto, 546 feet. It is sunk on the south dip of the Mammoth vein, 40 feet thick and dips at an angle of 46°. The slope is very substantially built. A 60 horse double acting steam pump in the slope, 2 16 inch columns, which does not communicate with the old slope, and a good pole pump on hand if needed; 3 drifts are open on the north dip of the slope; 260 feet of a schute conveys this coal to the breaker; the 3 drifts run in 1,760 yards east; the slope east gangway has a run of 2,600; the west ditto, 1,700 yards, and a tunnel drove north will open the Skidmore vein. The north line of this tract forms the dividing lines of Schuylkill and Columbia counties. When all the veins on the tract are working, it bids fair to say it will be one of the best collieries in the county.

Gangways.—5 gangways=16,767 feet; some 30 breasts working on it, and the coal is 40 feet thick.

Ventilation.—A 20 horse steam fan in use; the upcast shaft from the new lift to the water level is of an area of 59 square feet; the fan is located in this level; the east air-hole from the lower level to this counter gangway is 27 square feet; the east air-hole is 27 square feet; here there is some gas evolved; about ten per cent. of the volume of air in the east gangway; the headings are to be enlarged along the gangway and through the pillars into the breasts; area of east gangway is 88 and the west do. 84 square feet; a cross-hole through all the pillars along the heads of the breasts for the air to sweep through, and the schutes batteried off with canvasses on the draw-holes; the fan exhausts the air into the water level gangway; the mines and air are well managed. I measured the air and found it $3\frac{1}{2}$ times slow; on the west side I found the air to be $2\frac{1}{4}$ times slow.

Engines.—One 150 horse engine in use, hoisting coal; a 50 horse do., breaking coal; a 20 horse steam fan; 5 horse do. feed pump; a $2\frac{1}{2}$ horse do. feed pump; a 50 horse engine on the dirt plane; 7 engines=$397\frac{1}{2}$ horse power; 6 boilers, 34 inches+36 feet; 4 do., 34 inches+36 feet; 7 do., for steam pump, 120 horse power, 34 inches+36 feet; 3 do., dirt plane, 34 inches+36 feet; 20 boilers=720 feet long; grate area, 260 square feet, all of which are in excellent order; 2,200 feet 2 inch wire rope in slope; 1,800 feet do. $1\frac{1}{4}$ inch on dirt plane; 1,887 feet $1\frac{1}{4}$ on the coal plane.

Remarks.—The colliery was started in 1860 and was reconstructed in July last; shipped but two months in operation.

Recapitulation.—One slope, 2 lifts, 972 feet; 4 tracks, 48 inch gauge; 2 gangways; 3 drifts, 16,767 feet long; 2,000 feet outside tracks; 4,000 feet wire rope, 2 inches and $1\frac{1}{4}$ inches; 600 feet dirt plane; total length of tracks inside and out is 19,739 feet, 48 inches gauge, 28 pounds rail; 7 engines, $397\frac{1}{2}$ horse power; 20 boilers, 34+36=720 feet; grate surface, 260 square feet; 325 men and boys employed; 14 mules, 76 wagons; 1 pump. 120 horse; one 20 horse fan; 2 safety tracks; temperature outside, 43°; do. inside, 56°; visits, 3; distance 142 miles; air $2\frac{1}{4}$ times slow; killed, September 1, David Davis, by a fall of coal; injured, none; 7 per cent. of mineral salt in water; condition of colliery favorable; shipping capacity, 80 cars; will ship 130 cars per day; officers: E. Bast, operator; Jacob Steinhiber, boss miner; 1st engineer, Anthony Ferguson; do., Marcus Daniels; do., Richard Davis; 60 blocks of buildings on the premises; coal transported over the Mahanoy planes.

No. 112.—Gilberton Colliery.

Inspected November 25, 1869.

Description.—I herewith transmit a detailed statement of the above colliery as herein set forth. This colliery is located on the John Gilberton tract, 4 miles west of Mahanoy City, and 34 miles, by rail, north-east of Pottsville, on the north side of the Ashland and Mahanoy railroad; leased and operated by the Gilberton coal company. The colliery consists of 2 slopes sunk on the south dip of the Mammoth vein. The old slope has been worked out and now used for a pump slope. The new slope is 330 feet deep, 18+16+8=136 square feet. The slope is laid with one track at top and bottom but double in the middle. A stepped traveling road is made on the west side, and the old slope is used for pumps, etc. The west gang-

way is in 3,000 feet; the east ditto, 2,850 feet, and is working under the west gangway of the Furnace colliery of Alkins & Brothers—this by right of contract.

Ventilation.—A 15 horse steam fan ventilates the mines. The slope is made an intake. The first air hole is 30 feet east of the slope, of an area of 48 square feet. A monkey air-course drove on the upper side of the gangway. The gangway is partitioned off by a door, and the air is made to pass over the gangway at this door and brought in to a dog-hole air-course along to the face of the gangway, airing the gangway and passing up into the breasts; returns back through the breasts by the cross-holes in the pillars to the original air-hole and out to the fan. The steam pump exhausts into this outcast air course on the west side, which crosses over the slope and connects with the fan outcast. The west gangway is made an intake to its face and returns similar to the eastern air. The ventilation is pretty good; air, 4 times slow.

Engines.—50 horse hoisting, 14 inches+4½ feet cylinder; two 6 feet+10 feet drums; 15 feet wheel, 6 arms, 6+8 inches rim; 5 feet pulley; 8 feet pump wheel, 12 inches face; 8 boilers, 36 inches+36 feet long; grate area, 5+24=120 square feet; steam at 80lbs; 2 80 horse engines, 20 inches+4 feet cylinders, link movement; 2 drums, 12 feet+5 feet long; 2 pinion wheels, 13 feet diameter, 14 inches face; 3 wheels, 6 feet diameter, 14 in. face; 1,000 feet 1¾ inch wire rope=54 tons; a 10 horse fan engine, running at 50 revolutions, can run at 150 ditto; 1 shaft, 10 inches+8 feet; ditto, 12 inches+9 feet; ditto, 12 inches+8 feet, and ditto, 12 inches+8 feet long; 6 boilers, 36+36 ft.; grate, 92 feet; 200 horse engine for pumping purposes, 25 inches+4 feet cylinders, and a 50 horse pumping engine, 16+6 feet long cylinder; 50 horse breaker engine, 16+6 feet cylinder; 2 boilers, 36 inches+36 feet long; all the above machinery is in the best condition in all its appointments.

Remarks.—The new slope is 390 feet deep; the old slope, 390 feet deep, and 50 feet west of it, the old slope is used for the steam pumps and a traveling road; the air-course from the western district of the mines crosses over both slopes, through an air-course made for that purpose; the steam pump is located in an engine room, 45 feet still west; a double acting, (one of Allison's patent,) and exhausts its steam into the fan outcast shaft; 200 yards from the slope, an air-course is carried on the west gangway to the face, and the air works back through the breasts to the fan air-course; the colliery is well kept, but there is some air leaking along the old works, some of which escapes out to the surface; the air was measured and found to be 4 times slow; temperature outside, 42°; ditto inside, 54°; a map of the mines called for; 222 men and boys employed; 20 mules; 60 wagons in use; one vein 30 feet thick; 30 breasts, 36 feet wide, 315 feet long, 24 feet pillars.

Recapitulation.—Two slopes, each 390 feet deep; 4 tracks; two wagon tracks, 1 pump and 1 man-road in each; 2 main gangways, 5,850 feet; 100 old and 22 new breasts; one 10 horse steam fan, 14 feet diameter paddles; six engines=470 horse power; 17 boilers, 36 inches+36 feet=512 feet long; area of grate surface, 5 feet+51 feet=255 square feet; 1,000 feet of 1¾ inch wire rope=54 tons strain. Killed or wounded, none; 2 visits, 109 miles; one vein working; the coal is from 25 to 30 feet thick; 22 new breasts, 30 feet+186 feet long; 18 feet thick pillar; 5,850 feet of tracks inside; 1,500 feet of track outside; one 200 horse steam pump; one pole do.; 220 men and boys employed; 20 mules and 60 wagons in use; outside temperature, 42°; ditto inside, 53°; 3 escape roads for miners; air 4½ times slow; condition of mines favorable; but some changes promised to be made, as

the Ashland and Mahanoy railroad pass over five of the breasts, it is eminently necessary to keep a constant watch, or else it may result in loss of life and property; shipping capacity, 90 cars; doing 80 cars per day.

No. 113.—Keystone Colliery.

Inspected November 26, 1869.

Description.—This colliery is located at Locust Dale, 2 miles west of Ashland and 15 miles north of Pottsville, on the estate of John P. Brock, Esq., now leased and operated by Mr. William Kendrick. The Ashland and Shamokin extension of the Mine Hill railroad passes close to the works. The colliery consists of a slope and two drifts on the Mammoth vein, dipping north $62\frac{1}{2}^{\circ}$. The coal is 30 feet thick; the slope is 462 feet deep; section area, 22+18+9=180 square feet; also a new pump slope is sunk 45 yards east of the coal slope of an area 11+8+8=76 square feet. This slope is to be exclusively used for a pumping slope and will also be used for a steam fan outcast shaft. There is some carburetted hydrogen evolved in this mine. Though there are two steam fans in operation, the company intend to erect a 30 horse steam fan, 24 feet diameter paddles; square of paddles, 6+8=48 square feet, of 8 arms=384 square feet section, and have corresponding air-courses, headings and outcast air-shaft, with all the most approved system of mining carried on throughout. This will greatly prevent dangers to the lives of the miners; a mine once redeemed from gas or noxious air, the proper working of a colliery and the dangers to the miners' lives are alike benefitted. The old works have their gangways extended to the western boundary line, and are now in the act of taking out the pillars, except some strong pillars left for to support the new slope.

Gangways.—The drift, the water level drift gangway will be supported for drainage and an outcast air-course. This gangway is run in 4,350 feet; the creek gangway is in 4,800 feet; the North vein gangway is in 1,620 feet; the Six-foot vein gangway is in 450 feet; the 4 gangways are 11,220 feet; no new breasts are working.

Ventilation.—Two steam fans ventilate this mine; the drift gangways are used as intake air-courses to the slope, and thence carried by air-courses along the gangways to the face; thence up through the working places, and returning through the breasts and pillars to the fan outcast air-course. The robing of these old works requires sufficient air to dilute the amount of gas, as there is quite a large amount of it evolved, and the miners in constant peril.

Engines.—A 30 horse power engine is used at the breaker; 2 boilers, 34 inches+30 feet; the coal plane engine is a 60 horse power; 2 boilers, 34 inches+30 feet; the dirt plane engine, 60 horse power; 3 boilers, 32+36 feet; a feed pump 20 horse engine; 2 boilers, 30 inches+30 feet; a steam fan, 8 horse power, and another 8 horse steam fan; 2 boilers, 30 inches+26 feet; a 40 horse steam pump; 2 boilers, 30 inches+30 feet long; 7 engines=220 horse power; 13 boilers=400 feet long; area of grate surface, 156 square feet; 1,000 feet $1\frac{1}{4}$ inch wire rope in slope; 1,200 feet $1\frac{1}{8}$ inch rope on the dirt plane; 1,400 feet $1\frac{1}{8}$ inch rope on the coal plane; in all, 3,600 feet rope.

Remarks.—The colliery is in operation some ten years; all above the water level the gangways all run west; a new slope recently sunk, with excellent machinery attached, will soon make this a very valuable colliery, but

there is a large amount of gas evolved which will require the greatest caution on the part of the present operator to secure the mines against explosions, and on this head Mr. Kindrick is understood to erect a 40 horse steam fan, of 24 feet diameter, with suitable air-courses to correspond, which will be found competent to keep sufficient fresh air in the mines at all times; this precaution is needed, and we recommend this plan for the future protection to life, &c.

Recapitulation.—One new slope, 462 feet deep; north dip 62½ degrees; section area=22+18+9=180 square feet; the pump slope 400 feet deep; section area, 11+8+8=76 square feet; 3 drifts=11,220 feet long; 1,200 feet outside tracks; 920 feet slope tracks, 48 inches gauge, 25 pounds rail; 900 feet siding, 48 pounds rail, 54 inches gauge; in all, 14,240 feet track. Number of visits, 2=64 miles; 2 veins, 30 feet thick; 7 engines, 220 horse power; 13 boilers, 400 feet long; 156 square feet fire area; one 40 horse pump; 2 steam fans, each eight horse; 240 men and boys employed; 26 mules, 43 wagons used; 2 escape roads; temperature outside, 43°; do. inside, 56°; air 5½ times slow; 20 per cent. of gas in volume; condition of mines good; shipping capacity, 70 cars per day; 2 killed; injured, none; the colliery is in good condition in all its appointments.

No. 114.—New Castle Colliery.

Inspected November 27, 1869.

Description.—This colliery is located at New Castle, one mile above St-Clair and five miles from Pottsville, on the estate of Messrs. Potts, Banan & Richardson, leased and operated by George S. Rippleir; the mines are operated for a number of years very successfully. The colliery consists of three slopes, sunk on the north dip of the Big vein, on a dip of 55 degrees; the old slope 150 feet deep, No. 2 slope 650 feet deep, and No. 3 slope 720 feet deep; the old slope is now solely used for pumping, and the colliery is not at present doing much, but some time since was one of the first collieries in the county.

Gangways.—Three west gangways is all that is now working; the east gangway is in 3,600 feet; the west ditto, is in 4,800 feet; the tunnel is 189 feet long; the section area of these gangways is 66½ square feet, and the coal is 75 feet thick; third west gangway is in 4,380 feet long; the main west gangway is 4,500 feet long, and tunneled to the Seven feet vein; the Seven-feet vein is 510 feet long; 22 breasts working in the mines, each 30 feet wide and 366 feet long; here the coal is 100 feet thick; these 5 gangways is 17,979 feet long and 12,000 feet outside tracks—total length of tracks, 29,979 feet, of 48 inch tracks of 28lbs rail.

Ventilation.—A large steam fan ventilates the working district of the colliery, and one of the first steam fans in the State; the fan is a 10 horse power and 12 feet diameter; the fan is erected on the Seven-feet vein, and an arranged system of stop doors forces the air into the proper working places of the mine, and by this system the air is well managed and very little complaints about air or management.

Engines.—A 60 horse slope engine 18 inches+6 feet cylinder, 3½ inch rods; 4 boilers, 32 inches by 30 feet long; grate surface, 58 square feet; 80lbs steam; a 90 horse steam pump, 20 inches by 8 feet cylinder; a 60 horse slope engine for pumping; a 40 horse breaker engine; a 15 horse dirt plane; a 40 horse locomotive engine; 19 boilers, 34 inches by 20 feet=

440 feet long; 7 engines=401 horse power; 780 feet=1,560 feet $1\frac{1}{4}$ inch wire ropes in new slope, and 1,200 ditto No. 2 slope, and 800 feet $1\frac{1}{8}$ inch on dirt plane=3,560 feet in all.

Remarks.—The colliery is not doing much at present, and still there is a large amount of coal yet remains in the upper works; the coal is from 75 feet to 100 feet thick, and the run east and west is over a mile each way; the safety of the miners is cared for as far as can well be done; there are three air-holes made downcasts, and the steam fan is located some three-fourths of a mile west of the old slopes; the air is forced into all the working departments of the mines, and through the breasts and pillars back to the fan. I directed the air to be collected at the tunnel to supply the gangway breasts, and run it up 40 yards, and air the upper gangway about 100 yards up as a counter gangway, and bring two air-holes to the fan; an air-hole in the face of the west gangway is drove out to daylight; I measured, and found it to be $5\frac{1}{4}$ times slow; a change as directed which will obviate the difficulty in the air, &c.

Recapitulation.—3 slopes; No. 1=150 feet deep, No. 2=660 feet and No. 3=720 feet=in all 1,530 feet deep; 5 gangways, 17,979 feet long; 7 engines=401 horse power; 19 boilers=440 feet long; grate surface 175 square feet; steam at 80 pounds; 3,500 feet wire rope; 22 breasts, 30 feet long and 366 feet long; 24 feet pillars; 2 veins coal, 75 feet to 100 feet thick; 3 pumps; one 10 horse steam fan, 12 feet diameter; 250 men and boys employed; 26 mules and 60 wagons; killed and injured, none; outside temperature, 48 deg.; do. inside, 62 deg.; difference, 16 deg.; air $5\frac{1}{2}$ times slow; 10 per cent. gas in the Seven-feet vein; capacity of shipments, 60 cars per day; the colliery is 32 years in active operation.

No. 115.—Spruce Forest Colliery.

Inspected November 29, 1869.

This colliery is located on the John Richardson tract, a little east of New Castle, on the line of the Mill Creek and Broad Mountain railroad. The colliery is operated by Lucas Denings & Co.; it consists of a slope sunk on the south dip of the Primrose vein, with a dip of 88 degrees; the slope is 225 feet deep; one cage track and one pump road; section area 21+6 feet=126 square feet; one pole pump, 14 inches, 6 feet stroke; the coal is six feet thick; 2 air-holes, one of 70 yards east and one 70 yards west of the slope; the colliery is a new one and in good condition; the slope is 1,200 yards east of the breaker.

Gangways.—The east and west gangway is in 1,200 feet long, and has some 16 breasts; are now working in the mine.

Ventilation.—The mines are ventilated by two air-holes; the steam pump exhausts into the air-hole; this air-hole is located between the first and second breast of an area of nine square feet; the air-hole is quite too small; it should be of an area not less than 36 square feet; the air is very poor through the summer, but the colliery is at present new and the openings small; there is some smoke in the slope.

Engines.—One 80 horse engine in use at the slope, 18 inches+6 feet cylinder; 6 boilers, 34 inches+30 feet long=180 feet; a 25 horse breaker engine; 2 boilers, 30 inches+30 feet=60 feet, and a 15 horse breaker at the slopes to clean the coal; a steam pump, is 6 inch pump, in the slope; these engines look well and very good attention given to cleanliness.

Remarks.—I have recommended the adoption of a steam fan to ventilate the colliery and to enlarge the present air-courses; to use the slope for a down-cast and place check-doors on the gangways to force the air up into the breasts by cross-heading in the pillars and to return it back to the fan up-cast shaft; this would be a correct system and would thoroughly ventilate the mines.

Recapitulation.—One slope, 225 feet deep, section area, 21+6=126 square feet; 1 track, 6 feet gauge; 1 pump road, 4 feet do.; 3 engines, 120 horse power; 6 boilers, 34+30 feet=180 feet long; 2 gangways, 1,200 feet long; 16 breasts, each 30 feet wide; 2 air-holes; 1 visit, 12 miles; killed or injured, none; 50 men and boys employed; 4 mules and 22 wagons; 550 feet $1\frac{1}{2}$ inch wire rope; grate area, 82 square feet; outside tracks 2,200 feet; total track, 3,400 feet long; 2 escape roads; temperature inside, 60 degrees; do. outside, 42 degrees; difference, 18 degrees; air 11 times slow; shipping capacity 15 cars per day.

No. 116.—Eagle Colliery.

Inspected November 30, 1869.

Description.—This colliery is located at St. Clair, 4 miles north of Pottsville, on the estate of ———; operated by G. W. John & Bro., successors to Thomas and William John, deceased. This firm has successfully operated these mines these 25 years, and has produced not less than two millions of tons of coal. The colliery consists of one slope, of a lift to the water level, some 360 feet deep, of 4 tracks. The new slope is 600 feet deep and dips south 27 deg., of an area of 24+25+8=176 square feet. This slope, too, has 4 tracks, of 48 inch gauge, 28lb. rail. This colliery is the most extensive colliery in the Union. There are 35 different gangways in the mines; the surveyed length is $15\frac{1}{2}$ miles inside, and 2 miles outside tracks. The local advantage this mine possesses places it in the front of the collieries of the county, and under the ordinary condition it is now in, it bids fair to yield nearly 100 cars per day for some 12 years longer. The Mammoth, Skidmore and Seven-foot veins form an unusual thickness in this basin, and the partition slate is not of much thickness, and very little gas evolved.

Gangways.—To describe these gangways is more than we have time or space, but suffice it to say they are —— feet, with 10,560 feet outside tracks. Some one hundred breasts are working, differing in width and length, with counter gangways, one above the other, in stories of great height and length; the total length of tracks, taking the slopes in, will make 97,320 feet of 25lb. T rail=$18\frac{1}{2}$ miles.

Ventilation is effected by a steam fan and check-doors on the different gangways, with well batteried schutes and sufficient headings, and all the proper details of mining carried on. I measured the air in several places in the different gangways and found it to average $2\frac{1}{2}$ times slow. As there is but little gases evolved, the mines are very safe otherwise.

Engines.—A 20 horse steam ventilating fan; a 20 horse breaker engine, 10 inches by 4 feet cylinder; 2 boilers, 30 inches by 24 feet; a 50 horse slope engine, 16 inches by 5 feet cylinder; 4 boilers, 30 inches by 24 feet; a 10 horse smith-shop engine, 12 inches by $2\frac{1}{2}$ feet cylinder; 1 boiler, 30 inches by 16 feet; a 50 horse inside slope engine, 16 inches by 6 feet cylinder, and a 90 horse slope engine, 18 inches by 6 feet cylinder; 6 boilers,

34 inches by 40 feet long; 6 engines=240 power, and 13 boilers, 30 inches by 34 inches=400 feet; steam at 90 to 70lbs; the beams are not stamped; 2 pole pumps, 18 inches by 7½ feet cylinders; 178 square feet grate surface; 2 chains, 1 inch, 450 feet each=900 feet long; 1,350 feet 1½ inch wire rope; 1,041 feet gum belts.

Remarks.—I recommended a 40 horse steam fan to be erected in this mine, in consequence of the vast opening, and to afford sufficient fresh and pure air, but owing to the system of mining carried on, there are but few at work in any one department, and therefore the powder smoke is but slight, and of no hinderance whatever; the pillars are left of sufficient strength to warrant the safety of mines and miners, and the safety roads are very many and the drainage good; with little or no timber used in all the gangways, few collieries are to be met with better managed than the Eagle colliery, and have fewer accidents or complaints.

Recapitulation.—The old slope is 360 feet deep; the new ditto, 600 feet deep, each having 4 tracks; 35 gangways, aggregate length 84,840 feet; double length of slope, 1,920 feet; outside tracks, 10,560 feet=18½ miles; 6 engines=240 horse power; 13 boilers=400 feet long; area of grate surface, 178 square feet; 900 feet 1 inch chain; 1,350 feet 1½ inch wire rope; dirt plane, 500 feet 1 inch rope; 1,041 feet gum belting; 3 veins, 33 feet thick; 120 feet elevator; one 90 horse two pole pumps; 20 horse steam fan; 278 employees; 41 mules; 150 wagons; 2 visits, 20 miles; temperature inside, 66°; ditto outside, 42°; difference 24°; one killed; injured none; air 2½ times slow; condition of mines favorable. Officers: S. Myles, agent; boss miner, Thos. Croxton. Colliery in operation 25 years, and estimated to continue undiminished 12 years; shipping capacity, 100 cars per day.

No. 117.—Commercial Colliery.

Inspected December 1, 1869.

Description.—This colliery, as herein described, is located near Silver creek, on the Old Valley Furnace tract, one mile north of New Philadelphia and ten miles, by rail, east of Pottsville. F. B. Gowen, Esq., president of the Philadelphia and Reading railroad, is guardian for the heirs of this estate; leased and operated by Gideon Bast, Esq., & Co. The colliery has a large field of coal to mine, owing to the many veins of coal and the length of the runs to the boundary lines of the tract, which is in extent 2½ miles long by 1½ miles broad. The colliery consists of three slopes, two of which are sunk on the south dip of the Primrose vein, and the third sunk on the north dip of the same vein; the numbers two and three slopes are sunk on the saddle of the vein close to and opposite to each other, so that the same engines and machinery are made available for both. The south slopes dip at an angle of 50 degrees, and the north slope dips at an angle of 65 deg.; the old slope, which is 60 yards east, dips at an angle of 35 deg.; a tunnel now driving north to the Mammoth vein will be 180 yards long; that point reached, will then make this colliery a valuable one, as the premises are in good condition to last for a number of years longer, and the still better advantage of cheap tolls to Port Carbon. The new slope is sunk 810 feet deep; section area, 22+20+8=168 square feet; 4 tracks, 44 inches gauge. The north slope is 270 feet deep; section area, 20+16+8=144 square feet; the old slope is 310 feet deep; section area, 24 by 22 by 8=184 square fee[t]

each having four tracks; 3 good safety roads run out to the surface, and the breaker is within 60 yards and nearly central to all the slopes.

Gangways.—As the colliery was not in operation for the third visit made, we can give here only the machinery and improvements, &c. The ventilation is effected by air-holes, but the company contemplate to erect a 15 horse steam fan.

Engines.—A 60 horse hoisting engine at the new slope, 15 inches by 6 feet cylinder; 8 boilers, 34 inches by 30 feet long; 108 feet grate surface; steam at 64lbs; 150 horse steam pump, 36 inches by 8 feet cylinder; two 16 inch columns, and in the North slope a pole pump, 38 inches barrel; 9 boilers, 3 of which are 34 inches by 24 feet, and 6 ditto, 32 inches by 30 feet; the section area of grate, 100 square feet; a 60 horse engine, 18 inches by $4\frac{1}{2}$ feet cylinder, and an 80 horse two pole pump, 18 inches by $6\frac{1}{2}$ feet cylinder; two pumps in this slope, the old slope; a 25 horse breaker engine, 12 inches by 3 feet cylinder; 3 boilers, 30 inches by 24 feet; in all 5 engines= 375 horse power; 20 boilers, 564 feet long, 260 square feet; 1,820 feet $1\frac{3}{8}$ inch wire rope, and 650 feet $1\frac{1}{2}$ inch ditto in North slope; 820 feet in old slope of $1\frac{1}{4}$ inch, in all 3,390 feet.

Remarks.—This colliery is put in condition to lease, and until a tenant is procured, the mines are probably to continue idle; and owing to very little gangways being open on the new slope, and no persons working in the old works, there was not a satisfactory inspection made, until the colliery goes into operation; none killed or injured this year; 4,000 feet outside track, 44 inch gauge, 25lbs rail; 225 men and boys employed; 35 mules; 80 wagons in use; no further report can well be made at present; the number of visits, three; distance traveled, 54 miles. The colliery is now offered for lease for a number of years.

No. 118.—Girard Mammoth Colliery.

Inspected December 2, 1869.

Description.—This colliery is located at Raven run, two miles east of Girardsville, on the line of the Quakake railroad, and 20 miles by road from Pottsvile, and 39 by rail; the colliery consists of three drifts on the Mammoth vein, and one ditto on the Skidmore vein, and a tunnel is now driving north to the Buck Mountain vein; the estate belonged to the late Stephen Girard, of Philadelphia, leased by his heirs to John Donaldson & Brother; the veins dip south from 15° to 35°; the tunnel will be some 819 feet long; this is one of the longest in the county in any coal mine.

Gangways.—The tunnel that is drove to the Mammoth vein south to the distance of 450 feet, is drove under it 10 feet and holed up through the partition slate to the vein. A counter gangway is here formed and slant branch gangways run into the breasts; the wagons are unloaded into schutes drove through this slate along the tunnel, and the coal re-loaded again in the tunnel. This business creates extra labor and expense, 1,692 feet from the tunnel on the west gangway to the tunnel on the Big vein. The west gangway is 4,200 feet in; the east ditto is 1,800 feet in; the Skidmore gangway, east side, is 834 feet in; the total length of the tunnel when completed will be 1,395 feet; the lower south gangway on the Skidmore vein is 1,500 feet in, and on the top lift or counter is 1,200 yards in; the west side gangway is 4,200 feet in; the tract is $2\frac{1}{2}$ miles long; there are at

present 32 breasts working on it; in all the gangways their aggregate lengths are 15,200 feet.

Ventilation is effected by furnaces and air-holes. An air-hole at the inside door on the west gangway runs up 60 yards to the surface, of a section area of 54 square feet; the air passes into the tunnel in the Big vein, and at the 63d breast there is another air-hole out to the surface, and is still driving out another to the surface; there is a small furnace on the south drift gangway which attempts to ventilate it, but much smoke prevails here.

Remarks.—There should be a door at the monkey air-course to force the air into the breasts; this air-couse is 25 square feet. The breaker is in fine condition for 10 years to come.

Recapitulation.—4 drifts=15,200 feet long; about 32 breasts working in all the mines; 180 men and boys employed; 21 mules; 62 wagons; one 40 horse breaker engine, 12 inch+3 feet cylinder; 4 boilers, 34+32 feet; 3 drift coal planes, 170 yards, with 900 feet $1\frac{1}{4}$ inch rope; 4 air-holes; 3,482 feet outside tracks, 44 inch gauge, 25lb. rail; 4 veins, with 48 feet thick of coal; air, $5\frac{1}{2}$ times slow; one visit, 41 miles; temperature outside, 46 deg.; ditto inside, 57 deg.; difference, 11 deg.; killed, Philip Tullis, Sept. 30, by a slow shot of powder in the face; injured, none; shipping capacity, 50 cars per day, but could ship 125 cars a day. Officers: Richard Johnson, boss miner; outside boss, J. Gedling. The colliery is now 6 years in operation, and its condition favorable.

No. 119.—Chuyler Colliery.

Inspected December 3, 1869.

Description.—I herewith submit a detailed description of the above colliery, as herein set forth. The colliery is located at Raven run, near the Quakake railroad, seven miles east of Ashland and three miles north of the new planes, and thirty-eight, by rail, from Pottsville. The colliery consists of three drifts on the Big vein; they all run in westward; the mines are on the estate of the late Stephen Girard, Esq., and now leased by his heirs to the Heaton brothers and operated by those men some six years; it is one of the best managed mines in the county and bids fair to continue so; there is scarcely any gas of any sort, and the veins are flat, nearly so; the coal is about 12 feet thick and a safe place for miners.

Ventilation is effected by a 10 horse steam fan, which is erected on the Skidmore drift a few yards south of the breaker. The main west gangway is used as an intake air-course all the way to the fan; a parallel gangway is run in all the way, 30 feet apart, so this 30 feet pillar is holed into and tracks laid into the several breasts from the main gangway crossing the parallel gangway, which is some three feet higher; the empty cars are hauled in by the main and out by the parallel gangways, and each have a strong in and out air current, with the cross-holes having close-doors placed on them to check the air as the trains pass; some of these breasts are 500 feet long and 36 feet wide; the ventilation is good as the pillars are holed from breast to breast; very little smoke prevails here; the air passes through all the working districts of the mine to near the drift, where it passes in by a slant air-course to the fan; no complaints for air.

Engines.—A 10 horse fan engine, 12 feet diameter; 2 boilers, 30 inches by 20 feet; a 30 horse breaker engine; 4 boilers, 30 inches by 30 feet; area

of grate surface, 78 square feet; steam at 60 pounds; the beams stamped; a 40 horse coal plane engine; 4 boilers, 30 inches by 30 feet, and a 4 horse saw mill engine; in all, 4 engines=84 horse power; 10 boilers=280 feet long.

Gangways.—The east and west gangways on the Mammoth vein are 7,200 feet long; the south do., 3,600 feet long; 600 feet in Mammoth counter drift north, (new opening,) and 1,200 feet of tracks laid in the breasts=12,600 feet in all.

Remarks.—I have found no better ventilated or managed colliery in the county; no complaints whatever made to me, and its condition is safe to work in. No gas scarcely exists, and the drainage is very good.

Recapitulation.—3 drift gangways, 12,600 feet long; 30 breasts working in the mines; one visit, 42 miles; 2 safety escape roads; one 10 horse steam fan, 12 feet diameter; 160 employees; 16 mules; 66 wagons; 2,400 feet outside tracks, 48 inch gauge, 25lb. rail; temperature outside, 36 deg.; ditto inside, 56 deg.; difference, 20 deg.; 600 feet $1\frac{1}{8}$ inch rope; shipping capacity, 100 cars per day; 400 feet gum belting used. Officers: H. S. Shuman, Jas. Heckler, engineers. Condition of colliery, very good; air, $2\frac{1}{4}$ times slow; 3 engines, 80 horse; 10 boilers, 30 inches+280 feet; grate surface, 128.

No. 120.—William Penn Colliery.

Inspected December 4, 1869.

Description.—I herewith submit a detailed description of the above mines as herein set forth. This colliery is located on the Philadelphia City tract, 2 miles west of Shanandoah City, and 22 miles, by pike, north-east from Pottsville. The colliery is operated by S. E. Griscom & Co. It consists of a new shaft sunk on the Mammoth vein, 250 feet deep, the vein diping 48 deg. south, its section area 28+12=336 square feet; from the platform to the bottom is 293 feet high. A steam pump at present drains the shaft, but the firm will erect a bull pump so as to do away with having any steam in any manner in connection with the shaft timbers, as it effectually destroys the timber. There are some drifts also worked, viz., A drift is 3,000 feet, runs east; C drift is in 2,250 feet long, west; D drift, passing above the Mammoth vein to the Seven-foot vein, is 1,950 feet in. All the shipments are made by the Philadelphia and Reading railroad. There are other drifts open but not at present worked, and has a large amount of coal yet to be extracted from them, all of which is above water level. There are 70 double blocks of fine tenant houses on the premises, and reflects credit on the firm for the comfort tenants and their families must derive from such homes. The tract is heavily covered with timber. The firm has two breakers on the premises, if needs be to use both; also a saw-mill is in full operation, which fully supplies them with building lumber, etc. No gangway yet open on the shaft.

Gangways.—The three drift gangways is 7,150 feet long; the coal plane has four tracks, 160 feet each=640 feet long; 300 feet of an inside plane; 5 wire ropes=4,360 feet long; 3 veins, the coal of which is 68 feet thick; the whole length of T rail laid inside and out, is 9,590 feet.

Ventilation.—The shaft is ventilated by a 10 horse steam fan and the drift gangways by air-holes; the air-courses east and west of the shaft is to open 20 yards east and west from the bottom of the shaft, and drove up

with a slant 25°, until both meet in the fan outcast shaft, some 70 yards up the shaft; a strong pillar to support the slope on both sides, where these air-courses will be driven of sufficient section area to afford a safe man-road out to the surface, by opening into the counter gangway; doors placed on the outcast air-shaft at the counter with sliding doors to supply fresh air to the miners in passing up and down to the mines; nothing whatever will be placed in the shaft but the cage roads; all other incumbrances being removed, to warrant safety, and nothing will be left undone to insure the safety of the miners and mines.

Engines.—A 30 horse engine used to sink the shaft; a 20 horse ditto, used at the breaker, each having 2 boilers, 30 inches by 24 feet long; a 40 horse ditto; 3 boilers, 34 inches by 30 feet; also a breaker engine; two 70 horse engines used for the shaft; 6 boilers, 36 inches by 30 feet; a 30 horse saw mill ditto; 2 boilers, 34 inches and 30 feet; a 40 horse steam pump, receives steam from shaft boilers, having two 14 inch columns—in all 7 engines=300 horse power; 15 boilers=462 ft. long; grate area=231 square feet; 900 feet 1½ inch wire rope in shaft.

Remarks.—The colliery is in operation 6 years, and most of the top level coal worked out; no gas having been found to any extent in these mines, the firm intend mining the future coal on correct principles, and will do all in their line to warrant the safety of the miners. I have inspected the above colliery, and am able to say for it, that it gives satisfaction, and have been furnished with a map of the same for further use.

Recapitulation.—One new shaft, 250 feet deep; 2 tracks; 1 pump road; 2 out safety tracks; one 10 horse steam fan; one saw mill; 2 breakers; 3 planes; 1,360 feet ropes; 7 engines=300 horse power; 15 boilers=34 by 30 by 30 feet=462 feet long; section area of grate surface, 231 square feet; one 40 horse pump; 200 employees; 13 mules; 74 wagons; one visit, 44 miles; temperature outside, 40°; ditto inside, 53°; difference 13°; air not measured; condition of the mines favorable; 3 gangways, 7,150 feet; outside tracks, 2,440 feet—total length of T rail, 9,590 feet, 48 inches gauge, 28lbs rail; shipping capacity, 60 cars per day, can ship 160 per day, when in full operation; 3 escape roads for men out of the mines.

No. 121.—Tunnel Ridge Colliery.

Inspected December 7, 1869.

Description.—I herewith submit a detailed statement of the above colliery as herein set forth. The colliery is located on the Philadelphia City land tract, Troutman, Biddle, Borie & Co., directors; situated on the western limits of Mahanoy City, south side, and 31 miles by rail from Pottsville; the colliery is well located and has excellent railroad facilities; the coal can be shipped by either the P. and R. R. planes or the Mahanoy and Tamaqua and Catawissa railroads; the colliery consists of a slope and drifts, operated by Mr. George W. Cole; the slope is sunk on the north dip of the Skidmore vein, dipping at an angle of 42 deg. in depth; 480 feet section area at top and bottom; is 16 by 14 by 12=180 square feet, and in the centre an area of 24 by 20 by 12=264 square feet; 2 tracks of 6 feet gauge, and 30lbs rail; the slope is one of the very best constructed slopes in the county; having carefully examined the engines, boilers and tackle, I find them fully reliable in every particular; at the bottom of the slope, the gangways are turned off east and west; the coal is in quantity large, and in

quality good; I found no gas in any amount; water is a little troublesome; the tunnel drove north, cuts the Skidmore vein, the Seven-feet and Mammoth veins; the colliery is new and only six years in operation; the buildings are all in good condition.

Gangways.—2 east and 2 west gangways; the east Big vein gangway is 1,625 feet in and has 20 breasts open on it; the west do. is 495 feet and has 6 breasts on it; the Seven-foot do. is 2,000 feet in and has 15 breasts on it; the Sixteen-feet vein east gangway is 1,725 feet in; the Buck Mountain vein east gangway is 2,000 feet, and the west do. 1,300 feet in; the Sixteen-feet west gangway is 300 feet in; aggregate length of gangways is 9,940 feet; the tunnel is 500 feet long; in all, 10,440 feet, with some 52 breasts working in the mine.

Ventilation.—A 10 horse power steam fan ventilates the eastern district of the mine, and the western district is ventilated by an air-shaft, into which the steam from the 60 horse steam pump is exhausted; this increases the velocity of the air and its influence greatly accelerates the force of the draft in the chambers of the mine, yet it does not afford sufficient draft of air to insure a successful ventilation in the future increased openings; the air splits at the bottom of the slope to east and west; the slope being a downcast intake, and of much larger area than the fan and air-shaft together, the draft is not so strong and affords abundance of air for all purposes; the eastern air-course is 220 feet from the slope, and the western do. 150 feet; in each there is an escape traveling road for miners.

Engines.—A 40 horse engine, $3\frac{1}{2}$ rods; 3 boilers, 36 inches by 32 feet long; grate surface, 80 square feet; two 60 horse hoisting engines, 18 inches by 3 feet cylinder; 6 boilers, 34 inches by 30 feet; 1 steam gauge and a feed pump; 1 drum, 14 feet by 15 feet long; a 17 feet pinion wheel in its centre, geared to a 30 inch spur wheel; a 10 horse steam fan of 10 feet diameter, all of which is in excellent condition; 1,000 feet $1\frac{5}{8}$ inch rope=43 tons straining power; force in use is six tons; 60 horse steam pump; 5 engines=236 horse; 9 boilers, 36 inches and 34 inches by 32 and 30 feet long=276 feet; 120 square feet of grate surface; good water in use and well cared.

Remarks.—I have carefully examined the mines and found some powder smoke floating about in the western gangways; these gangways are 20 feet apart and run parallel east and west, with cross-cut air-holes at 50 yards distances, which is a proper way to ventilate; if the old former cross-holes were closed and the air forced into the working districts of the mine and face of these gangways by check-doors being placed on the gangway at the proper points, and the cross-headings in the breast pillars of sufficient section area to admit a full supply of fresh air to traverse these breasts back to the out-cast shafts, in this manner the smoke would be effectually diluted and removed, and the evil spoken of remedied; none killed or injured; much smoke prevails; a map furnished and on file.

Recapitulation.—One slope, 480 feet deep; dip north 42 degrees; section area, 16 by 14 by 12=180 square feet; 2 six feet tracks; 1,000 feet $1\frac{5}{8}$ inch rope; 9 gangways=10,440 feet long, with slope added=10,920 feet; outside track, 700 feet; total length of T rail, 11,620 feet; one 10 horse saw mill; 5 engines=236 horse power; 9 boilers=276 feet; one visit, 65 miles; 51 breasts, each 30 feet by 220 feet long; 6 yards pillar; coal 60 feet thick; 5 veins; grate surface 120 square feet; one 60 horse pump; 2 columns, 16 inches and 14 inches each; 1 air shaft; one 10 horse steam fan; 250 employees; 20 mules, 50 wagons; 160 feet outside coal plane; 200 feet 1 inch wire rope in use; shipping capacity, 100 cars per day; killed or injured, none; boss miner, Thos. Lewis; Mr. Cole, superintendent; 1st engineer,

Chas. M'Call; outside temperature, 26 degrees; inside do., east side, 48 degrees; west do., 53 degrees; difference, 27 degrees; air 5½ times slow; condition of colliery good and improvements promised.

No. 122.—Wiggan & Co. Slope.

Inspected January 9, 1870.

Description.—This colliery is located west of St. Nicholas one-half mile, and north of the Ashland and Mahanoy railroad, 32 miles north of Pottsville, by rail, on the estate of the Philadelphia coal company; leased and operated by Messrs. Wiggan & Treebles. It consists of a slope sunk 6 feet deep on the south dip of the Mammoth vein, 43 deg. dip; its section area 24 by 18 by 8=168 square feet; 4 tracks, 48 inch gauge, 25lb. There are 2 gangways, one east and one west; the east, 200 yards. There are 3 veins on the tract—the Mammoth, 18 feet; the Holmes ditto, 14 feet; the Primrose ditto, 10 feet=42 feet thick. The west gangway is in 1,000 yards; the east ditto, 700 yards; the west Holmes gangway is 60 yards, and east ditto, 200 yards; in all 4 gangways, 1,960 yards=5,880 feet; there are also 5 drifts worked out, which exceed 12,000 feet. The colliery is 8 years in operation.

Gangways described as above are 17,880 feet long, but the drifts are now abandoned. 30 breasts, 30 feet, 240 feet; 18 feet pillars.

Ventilation.—A steam fan ventilates the Big vein only; the other modes used are air-holes. The air comes out of the east gangway on the Mammoth vein; the overcast air-course on the slope is closed; the west air comes down an air-hole to the gangway and in by a dog hole on the bottom of the gangway, and comes back through the gangway, carrying with it all the noxious air and smoke, making it unbearable and suffocating. I directed Mr. ——'s attention to this, and directed the air to be conducted through a fellar from the downcast air-hole, as the steam exhausted into the slope reacts on the air which makes the slope an upcast, which steam will effect a dry rot on the slope timbers and very soon destroy them. This causes the air to pass out the ganways instead of passing in by them. The air should come in the gangway to a place where a check-door should meet it at the first working breast and cast it up into an air-hole in the headings, and pass in to the face of the gangways from breast to breast, carrying with all the noxious air and smoke from the miners, leaving the gangway clear, and pass over the gangway down to the dog-hole on the bottom of the gangway and out by it, and out to an upcast air-hole outside of all the working breasts. The schutes want plank batteries with canvasses on the draw-holes; it also wants a door in the gangway at the second door in a heading in some of the pillars to take the air to the face of the work. The area of this air-hole should be 36 square feet section. The outcast air-hole is 8 yards wide at bottom and only 4 feet by 3 at top; this should be uniform all through, so as not contract the air. Just at the fan outcast I found sufficient air but not properly conducted, and had miners been at work in the mines, nothing could be visible at a near distance in the gangway. After measuring the air I found it 3½ time slow.

Engines.—A 60 horse hoisting engine, 18 inch by 5 feet cylinder; 20 feet wheel, 8 arms, 5 by 9 rim; shaft, a 10 inch by 8 feet; the pump ditto, 10 inches by 14 feet; an 8 feet pinion; a 4 feet ditto, and a 3 feet spur wheel; a 60 horse steam pump, double acting; one 9 inch column; a 40

horse breaker engine; a 6 horse fan engine; the breaker and fan engines are run by 4 boilers, 30 inches by 21 feet long=84 feet; the area of the paddles is 20 inches by 30 inches=4 square feet; 6 slope boilers, 36 inches by 24 feet long, 144. The third boiler I condemned. They carry 40lbs of steam; area of all grates, 130 square feet; one drum, $7\frac{2}{3}$ feet diameter by 10 feet; 4 spiders, 6 arms each, 9 inch laging, its shaft 9 inches by 15 feet long. The engines are old and a little neglected. 1,500 feet $1\frac{1}{4}$ inch wire rope in use. The slope is well and securely built, but the discharge steam will eventually destroy it.

Remarks.—All the air courses are too narrow for ventilation, and the air travels the wrong course. To better preserve the slope it should be used as a downcast and the fresh air carried through the gangways as far as the finished breast; a check-door here to throw it up into the working breasts, and some in the gangway to the face; thence back by the dog hole and over the gangway in an overcast at the new tunnel; thence to the fan outcast shaft, to relieve the gangway from smoke; no gas found in any body.

Recapitulation.—One slope, 600 feet deep; area, 24 by 18 by 8=168 square feet, 3 track; 4 engines, 166 horse power; 10 boilers, 34 inches, 224 feet; area of glale section, 130 square feet; 4 gangways, 5,880 feet long; area of gangway, 12 by 7 by 8=72 square feet; 2,400 feet outside track, 48 inch gauge=8,280 feet; 1,200 feet slope track; in all, 9,480 feet T rail; 1,400 feet $1\frac{1}{4}$ inch wire rope; 30 breasts, 240 feet long; 18 feet pillars; 4 outcasts; 4 escape traveling roads; none killed or injured; 200 men and boys; 12 mules; 50 wagons; temperature, 16 deg.; inside, 58 deg.; difference, 42 deg.; good drainage; the fan a 6 horse power, area of paddles, 4 square feet=24 square feet; air, $13\frac{1}{2}$ times slow; 3 veins, 42 feet thick; dip of veins, 43 deg.; shipping capacity, 80; ships 50 cars per.

No. 123.—Lorberry Slopes.

Not inspected, but visited at a time when all stood idle, intending to visit these collieries at a time when the miners would be at work, which will receive due attention in a few days. This first visit was when Joseph Workman was injured.

No. 124.—New Philadelphia Gate Vein.

Inspected January 14, 1870.

Description.—I submit herewith a detailed statement of the above named colliery as herein set forth. This colliery is located east of New Philadelphia, 9 miles east of Pottsville, on the south side of the Valley railroad, on the Valley Furnace track; leased and operated by Hines & Glasmire. It consists of a shaft sunk on the Gate vein, 100 yards deep; its section area is 6 by 16 square feet; the pump way is partitioned off in the shaft, and only one cage used; 2 boilers are now used and in position, and two more ready to be put in position, of 34 inches and 36 inches, and 26 feet long; a 10 horse breaker engine; a 40 horse hoisting engine, 15 inch by $4\frac{1}{2}$ feet cylinder; a 6 horse fan engine, 6 feet diameter paddles; square of paddles, $1\frac{2}{3}$ by $1\frac{5}{6}$=$2\frac{1}{4}$ feet=13 square. This fan is not covered in, and in conse-

quence of the size and narrowness of the draw-holes, it is impossible for any great relief to be obtained from it. There are two gangways 600 yards in, east, and 200 west; in all 800 yards; some gas in the east, and have to use safety lamps, which are not well cleaned. John Roper got burned at the same time with John Murry. 400 feet 1⅜ inch wire rope in use. It is a small colliery.

No. 125.—Turkey Run.

This colliery is a new drift, opened by Johnson & Devey, on the estate of J. P. White, east of Shanandoah City; they employ some 60 persons; this colliery also will receive due attention at a proper time.

No. 126.—Coal Ridge.

This colliery is some eight years in operation, and leased by H. Guitterman; it consists of a drift south, some 300 yards, and a slope sunk inside, some 300 feet deep; it gives employment to 100 persons, when in full operation; this colliery is operated by engine, and it will, too, receive due attention.

No. 127.—Forestville Colliery.

Inspected January 3, 1870.

Description.—I herewith submit a detailed statement of the above colliery as herein set forth. The colliery is located two miles west of Minersville, and six miles west of Pottsville, on the estate of the Forest improvement company; it is an old establishment, and of late has got the name of the Manhattan coal company's slope; the mines are approached by a branch of the Mine Hill railroad, and in former years was considered one of the best mines in the county, whilst under the direction of Richard and Charles Heckscher, Esqrs., who commanded the most influential reputation as coal shippers in the county. The colliery consists of an old slope, sunk 330 feet deep on the south dip of the Black Heath vein 42°, having three tracks; its section area is 14+16+6=78 square feet; the colliery is now leased and operated by John Wadlinger, who intends sinking a new slope a lift deeper, and who has constructed a new breaker and re-modeling the whole colliery anew; coal 7 feet thick.

Gangways.—At present the company is working only two gangways; the east gangway, 1,100 yards; the west ditto, 300 yards=4,200 feet; no breasts are worked, as they are nearly exhausted, and are only robing out the pillars.

Ventilation.—The mines are ventilated by a steam fan, 10 horse power, 12 feet diameter; the slope is used as a downcast air-course, and at the bottom of the slope is split and forced in the gangways east and west, on which there is check doors which forces the air up into the headings, and thence through the breasts to the working places, and returns by an ave-

nue to the fan outcast shaft; the mines are now old and very little doing, which answers for the air not being so very good; the air is 4½ times slow.

Engines in use.—A 90 horse hoisting engine, and a 90 horse pumping engine, 18 inches+4½ feet cylinders; a drum, 11 feet+11½ feet long; 4 spiders, 8 arms each, laged with 9 inch timber; a 20 feet fly wheel, 8 arms, 5+9 inches rim; 3 shafts, a 10 inch+9 feet, a 10 inch+9 feet, and a 10 inch+15 feet; 12 boilers, 30 inches+30 feet, and 3 of which are 40 feet=390 feet long; a 60 horse hoisting engine, 20 inches+4 feet cylinder; 9 inches+9 feet shaft; 12 feet wheel, 6 arms, 8+4 inches rim; 13 inches+23 feet shaft, works 2 pole pumps; a 20 horse breaker engine, 12 inches+3 feet cylinder; 3 boilers, 34 inches+16 feet long; 15 boilers, 34 inches=438 feet long; 4 engines; 210 grate surface, 195 square feet; a 25 horse dirt plane engine; 2 boilers, 30 inches+18 feet long—in all, 5 engines=235 horse; 17 boilers =30 inches=474 feet long; area of grate surface, 225 square feet; having inspected the said, together with 3,600 feet wire ropes, and find the said engines, boilers, ropes and machinery in good order in all its appointments.

Recapitulation.—One slope, 330 feet deep; south dip, 42 deg.; coal 7 feet thick; one visit, 14 miles; age, 13 years in operation; 3 tracks; temperature outside, 23°; dito inside, 50°; difference, 27°; 1 downcast; 2 safety roads; one 10 horse fan; 5 engines, 235 horse power; 17 boilers, 474 feet long; grate surface, 225 square feet; 3,600 feet wire ropes; 1 plane, 250 feet; 4,200 feet inside tracks; 1,800 feet outside ditto; 44 inches; 25lbs rail=1¼ miles=59 tons; 120 men and boys; 16 mules; 40 wagone used; none killed or injured; 12 per cent. bad water; 10 per cent. fire damp; no breasts worked; robing out pillars. Officers: Daniel Hoch, boss miner and manager; first engine-man, Philip Corns, competent.

No. 128.—Diamond Colliery.

Inspected January 4, 1870.

Description.—I submit herewith a detailed statement of the above colliery as herein set forth. This colliery is located at Forestville, on the estate of the Manhattan Coal company, two miles west of Minersville, and six miles west of Pottsville; it is also an old colliery, and the present operator is doing but very little, and contemplates sinking a new slope a little north of the present slope, which will, in that event, become a valuable colliery; the present old slope is sunk on the south dip of the Diamond vein, at an angle of 65°; the slope is 462 feet deep; it has 4 tracks and in a tolerable condition; there are three veins worked on this track; the Red Ash vein, 6 feet thick, the Gray ditto, 9 feet thick, the White Ash, 6 feet thick=21 feet of coal; 5 breasts working on this gangway, which is in 2,700 feet, each 27 feet wide and 130 feet long; the pillars are 27 feet thick; all these veins have gas of a fire damp character of 20 per cent., and the only lamps used by miners are the Davy safety lamps, and they need more care and cleanliness and attention; they are not locked and much rusted.

Engines.—A 50 horse hoisting engine, 15 inches+4 feet cylinder, 9 inches +9 feet shaft, 9 feet+12 feet drum; the shaft 9 inches+12 feet long; 4 spiders, 6 arms each, 14 inch timber laging; 8 feet pump wheel, 8 arms and 12 inches face; a 16 feet wheel, 8 arms, 5+8 inches rim. Hoisting engine 50 horse, 16 inches+4 feet cylinder; 14 feet wheel, 8 arms, 5+9 inches rim; shaft 9 inches+5 feet; an 8 feet pump wheel, 8 arms and 8 inches face; drum shaft 8 inches+16 feet long; a new bed plate needed as the pump bob

is too high; it shakes the whole foundation, and this matter is to receive attention as soon as convenient. 7 boilers, i. e. 4 do., 30 inches and three 34 inches=29 feet long, 203 feet long; area of grate, 96 square feet; 1 fan, 10 horse power, 10 feet diameter; 72 square feet area, runs 100 revolutions per minute; 15 horse breaker engine; 2 boilers, 30 inches+26 feet; grate surface, 25 feet.

Ventilation.—A 10 horse fan ventilates these mines; the slope is used as a down-cast air-shaft and the air passes in the gangways to the east and west stop-doors; thence up in the air-courses through the headings to the working places and returns through the old mouth to the fan out-cast shaft.

Gangways.—2 gangways run in 2,700 feet; 5 breasts working on it, each 27 feet wide and 130 feet long; the pillars are 21 feet thick to 15 feet do., and all the gangways worked out on the old levels.

Remarks.—The colliery was then idle and none at work; the air was not measured as the gas was considerable. I will visit this colliery soon and direct a better remedy for the ventilation of the mines.

Recapitulation.—1 slope, 462 feet deep, dips 65° south; 4 tracks; 2 gangways; total length of gangways is 2,700; 4 engines, 125 horse power; 9 boilers, 30 inches+255 feet; area of grate, 121 square feet; one visit, 14 miles; 5 breasts, 27 feet wide, 130 feet long; pillars 15 feet thick; 600 feet outside tracks, 448 inches gauge, 25 lbs. rail=$\frac{3}{4}$ mile=14$\frac{1}{2}$ tons; 3 veins, 21 feet thick; 12 per cent. acid water; 20 per cent. carburetted hydrogen gas; 17 bad safety lamps; none killed; 5 injured by explosion of fire-damp; Jas. Kelly fell off platform; John Philips, Wm. Shertle and John Davis burned by gas; Daniel Jones do. by explosion of powder; one visit, 14 miles traveled; temperature outside 26°; do. inside 53°; difference 31°; 1,000 feet 1$\frac{1}{2}$ inch wire rope in use; shipping capacity, 28 cars per day.

No. 129.—Buckville Slope.

Inspected January 5, 1870.

Description.—I herewith submit a detailed statement of the above colliery as herein described. The colliery is located at Buckville, two miles west of Tamaqua, and sixteen miles east of Pottsville, north of the Schuylkill Valley railroad, on the estate of the Tamaqua company, as Pardee, Roberts and others; it is an old colliery; the company has erected new and extensive buildings and very substantial machinery this season, and also sunk a new slope on the south dip of the C vein 600 feet deep; the second lift at an angle of 45°; the slope has two tracks, 56$\frac{1}{2}$ inches gauge; the bull pump engine is 20 yards west of the slope, and the establishments are all advantageously located in all their appointments; the slope is 600 feet deep; section area, 24+22+8=184 square feet.

Gangways.—The gangways are alphabetically classified; the E gangway is 350 yards in east and 269 yards west; the bottom level F vein east do. is in 200 yards; the west do. 30 yards=4 gangways=2,520 feet; 2,400 feet outside tracks, with 1,200 feet slope track, is=no breast working yet, but cleaning up the gangways and getting things in order for business.

Ventilation.—An 8 horse steam fan ventilates the mines, 8 feet diameter; 6 paddles, 30 square feet area; the ventilation not adequate at present.

Engines.—A 500 horse bull engine, 52 inches+10 feet cylinder; also two 50 horse hoisting engines, 16 inches+4 feet cylinders; one 250 horse engine pump, the old level, 30 inches+8 feet cylinder; a breaker engine, 30

horse, and the new breaker engine a 30 horse, and a 2 horse feed pump, in all 7 engines=912 horse power; drum 8 feet+12 feet; 5 spiders, 8 arms each; 12 inch planking; 2 shafts, 10 inches+24 feet and 10 inches+16 feet; a 14 feet fly-wheel, 6 arms, 5 inches+9 inches rim; link movement; two 8 feet sheaves, 4 inch grooves; 880 feet $1\frac{3}{4}$ inch wire rope; strain 54 tons and only 3 tons in balance; 2 new wire ropes on hand, each 1,200 feet long=2,400 feet $1\frac{3}{4}$ inch; a 7 feet pinion, 8 arms, 12 inches face; the old pump is 18 inches+8 feet cylinder; the slope is 100 yards deep, 22+20+10 feet=210 square feet, and the lower lift is 16+12 feet; the drift is 1,200 yards=3,600 feet in, and is now supplying coal; 13 boilers, 34 inches+36 feet=468 feet; 169 square feet grate surface; 80 pounds steam; water good; beams not stamped; 2 veins; E vein 18 feet and F vein 14 feet thick=32 feet of coal.

Recapitulation.—The old slope is 100 yards deep, used as a pump slope; the new slope is 600 feet deep; area, 184 square feet; 3 tracks; 2,080 feet $1\frac{3}{4}$ inch rope; 7 engines=912 horse power; 13 boilers, 34 inches=468 feet long; area of grates, 169 feet; one visit, 33 miles; temperature outside, 16°; ditto inside, 50°; 34° difference; 2 veins 32 feet thick; dip south, 45°; 4 gangways=2,520 feet; one drift, 3,600 feet long=6,120 feet long; pillars, 16 feet thick; 1 up, and 1 downcast; area, 36 square feet; 1 fan, 8 horse power; 8,520 feet T rail laid, $56\frac{1}{2}$ inch gauge, 25lb. rail, $1\frac{3}{4}$ miles; acidulated water, 5 per cent.; 10 per cent. carburetted hydrogen gas; 40 employees; 10 mules; 35 wagons; shipping capacity, 50 cars per day. All of the above engines, boilers, ropes and machinery are very substantial in all their appointments. Thos. Moss, boss miner; Hugh M'Cullough, assistant ditto; Chas. Brenner, 1st engineman.

No. 130.—Reeves Dale South.

Inspected January 6, 1869.

Description.—I herewith submit a detailed statement of the above mines as herein set forth. This colliery is a new slope located on the Sharp mountain, south of Reevesdale, sunk on the north dip of the O vein 420 feet, at an angle of 74°, having 3 tracks, each $56\frac{1}{2}$ inch gauge, just finished, and are turning gangways. The colliery is on the estate of Pardee & Co., or the Tamaqua Co. The breaker and siding tracks are yet to be built. It is one-half mile south of the Valley railroad at Reevesdale.

Engines.—Two 60 horse engines in use at the slope, 16 inch+4 feet cylinders; a 30 horse breaker engine on the premises; a 3 horse dirt plane engine; also a 3 horse feed pump; 10 good boilers, 34 inches+30 feet, 300 feet long; 5 engines=183 horse power; area of grate surface, 126 square feet; 2 veins working—the R vein, 10 feet thick, the O vein, 12 feet thick, but the coal is not good; the P and p veins, the Q and q veins, also the C, D, E and F veins are on the tract, and can be approached by tunnels north and south. The tunnel to the P vein is 50 yards west of the slope. 960 feet $1\frac{1}{2}$ inch wire rope in use; 90 feet outside tracks; inside, 150 feet; the 2 slope tracks, 840 feet; in all=2,040 feet T rail, $56\frac{1}{2}$ inch gauge, 25lb. rail; 125 feet dirt plane; 150 feet wire rope; in all, wire rope, 1,100 feet; one visit, 32 miles; temperature outside, 16; ditto inside, 48°=32° difference.

No. 131.—New Kirk Slopes.

Inspected January 5, 1869.

Descriptive statement of the above colliery I herewith submit as herein set forth. This colliery is located one-fourth mile north of New Kirk, one mile west of Tamaqua and sixteen miles east of Pottsville, on the estate of the Tamaqua company, Pardee, Roberts and others, and operated by the said firm; the colliery consists of a slope sunk on the south dip of the C vein 350 feet deep, on an angle of 74° dip, having 4 tracks, 56½ inches gauge, 25 pounds rail; there is a pump slope partitioned off east side of the slope; the slope is sunk on the Grayer vein, which is 6 feet thick, and north of it the Small vein, 5 feet thick; on this Small vein the pumps are placed, and only a few feet of a parting slate separates the two veins; nothing doing at this place but cleaning up the gangway, as the place stood idle for two years, and now the company contemplate mining anew and to sink a new slope directly north of the present one on another vein; the C vein is 20 feet thick and the F do. is 12 feet thick=32 feet of coal; a tunnel drove north, some 1,300 feet, cuts three other veins, and it is proposed to make this a first-class colliery in two years time; there is some 12 per cent. of carburetted hydrogen gas evolved, also 8 per cent. of acidulated water.

Engines.—Two 60 horse engines used for hoisting; a 60 horse pumping engine; 2 fly-wheels, 16 feet diameter, 8 arms, 6 inches+9 inches rims; 1 drum, 6 feet+12 feet; 4 shafts, a 12 inches+16 feet, a 12+8 feet, a 12+8 feet and a 12 inches+14 feet long; 2 chains, 900 feet, 1 inch; two 50 horse engines for pumping, 16 inches+7½ feet cylinders; a 16 feet wheel, 6 arms, 5+9 inches rim; 3 shafts, 12 inches+8 feet, a 12 inches+16 and a 12 inches +8 feet long, link movements; 13 boilers, 36 inches+30 feet long=390 feet long; 172 feet grate surface; steam at 80 pounds; beams not marked; a 30 horse breaker engine; 3 boilers, 30 inches+20 feet; area of grate surface, 36 square feet; 6 engines=310 horse power; 16 boilers=36+30 and 20=450 feet; area of grate surface=208 square feet; 800 feet outside tracks; 700 feet slope tracks; 1,300 do. tunnel and 1,300 in the two gangway tracks=4,100 feet T rails; John Hobblett boss miner; 1st engineman, Crist Bryant; Nicholas Bream, do.; escape roads, 2; temperature inside, 46°; outside, 17°; 29° difference; one visit, 33 miles; no shipments; cleaning gangways and pumping; 16 men, 1 mule and 60 wagons here.

No. 132.—Old Reeves Dale Colliery.

Inspected January 5, 1870.

A descriptive statement of the above colliery, as herein set forth. This colliery is located at Reevesdale, on the south side of the Valley railroad, two miles west of Tamaqua, and 16 miles east of Pottsville, on the estate of the Tamaqua company, and operated by James Glinn; the colliery consists of a drift gangway, tunneled south to the R vein, cutting through the following veins, as follows: the C, B, D, E, F, O, P and P, Q and Q, and R veins, which is the most southern vein on the tract; the tunnel is 1,500 feet long, and the only vein worked at present is the R vein; all these veins dip north at angles varying from 75° to 87°, and range in thickness from 5 to 20 feet thick; the place was at present comparatively idle.

Gangways.—The east gangway is 400 yards, and the west do. 700 yards; there are (4 west) 9 breasts working in the mines; I found no method of ventilation, but a very insignificent air-hole, not fit to relieve the mines of smoke or gas; the miners had suspended operations for want of air. Having found no person on the premises who had any charge, I am compelled to visit the mines again at an early day; the miners complain and are not able to work for want of air. The total length of inside tracks is=4,800 feet; 56½ inches gauge, 25lbs rail; 2,400 feet outside track; 1 plane outside. 125 feet=250 feet—in all. 7,450 feet; 13 breasts, 30 feet, 210 feet long; 16 feet pillars; 65 men; 8 mules; 35 wagons; 300 1 inch wire rope; 2 engines, 50 horse power; 3 boilers, 30 inches+25 feet long=75 feet; area of grate surface, 38 square feet; the temperature outside, 16°, and inside, 49°; 33° difference; 10 per cent. acid water; 16 per cent. carburetted hydrogen gas evolved, and 20 per cent. of powder smoke, when the miners are at work; little can be said of this colliery at present, as the mines were then idle; the breaker is tolerable safe to work in; the location is a good one, it being so convenient to the main line R. R., that little difficulty is experienced for car accommodation; capacity of shipment, 25 cars, but at present ships 15 cars a day.

No. 133.—Pardee's New Slope.

Inspected January 6, 1870.

A descriptive statement of the above slope as herein set forth. This slope is just sinking near Tuscarora, on the south of the Valley railroad, one-half mile in from the road, on the estate of the Tamaqua company, Pardee, Roberts and others. The slope is sunk 75 yards on the south dip of the O vein, at an angle of 74°. The slope has 3 tracks, 56½ inch gauge, 25lb. rail: This vein was formerly named the Smith and Hudson vein, and is 7 feet thick. It is proposed to tunnel from the west gangway of this vein 150 feet from the bottom of the slope, south to the other veins, to the R vein, which is supposed to be the most southern vein in the Schuylkill valley basin.

Engines.—Two 40 horse engines are used in pumping and hoisting; 6 boilers, 34 inches+39 feet long; 76 square feet grate surface; about 20 men employed, and a tub used to carry out the stuff.

No. 134.—New Boston.

Inspected.

Description.—I submit herewith a detailed statement of the above colliery as herein set forth. This colliery is located on the Delano land company's tract, one mile south of Mahanoy City, at a point where the Mahanoy and Broad mountains form into one, at the head of the New Boston coal basin eastward. The Pottsville water company's basin is located in this valley. The mine water having no other natural outlet, of course mingels with, and pass off together. The mines are some 31 miles, by rail, from Pottsville, and about 12 miles over the mountains, by way of St. Clair. The colliery is established on a very respectable scale, and the situation

quite pleasant. The miner houses consist of 30 blocks of ample accommodation; a school house, store and mansion house, with respectable colliery buildings. The coal is shipped over the Quakake railroad, and connects with the main line of that road near Delano City, some 8 miles east of the colliery. The colliery consists of a slope sunk on the south dip of the Skidmore vein—supposed to be so by some miners, whilst other veins are found on the tract. It is thought the Mammoth vein does not reach up to this part of the basin, but is found west of it. The shaft is 360 feet deep, on an angle of 33°; its section, 26+22+10=240 square feet, having two 48 inch tracks and two donkey tracks of 40 inch gauge. The length of the incline plane from the slope to the platform is 250 feet, thus making the whole length=610 feet=2,440 feet of track. There is a pump slope 48 feet west of it of an equal depth and of a section area of 12+10+10=110 square feet, having a track in it for a traveling road and material way, and 33 feet still west of this is a slope on which a 20 horse steam fan, 17 feet diameter is located, of an area of 8+12+8=80 square feet. The fan is properly constructed, etc., and well secured in position, and when the air-courses are once properly connected it will be an effective ventilator.

Gangways.—The east gangway on the lower level is 2,700 feet in; the west do. 1,800 feet in; the west counter-gangway is 750=5,250 feet long: areas of these gangways=12+7+7½=71 square feet, all of which are well drained; 25 breasts are open, each having 2 schutes, and are 30 feet wide +180 feet long; the pillars 18 feet thick; 2,700 feet outside tracks.

Ventilation.—The slope is used as a down-cast, and the air is split at the bottom and conducted in the gangways east and west for 300 yards to a check door; thence by a dog hole on the bottom of the gangway near the top slate to the face of the gangway, out the gangway to the counter air-hole; thence to air the counter-gangway works and returns through these works to the top air course; thence west, over the slope and pump slopes, to the fan out-cast shaft; the upper counter-gangway is aired by an ordinary air-hole, 140 yards out to the surface; there are two counter schutes and the counter-gangway; all this is on the east side as the surface recedes abruptly; no counter-gangways are used on the west side, but the breasts run up 240 feet; the air on the west side is 80 yards behind the fan out-cast air-shaft at a door, where it is driven up to the workings and back to the fan.

Engines.—One 40 horse double acting steam pump in the pump slope, 2 columns; two 90 horse hoisting engines, 20+6 feet cylinders; 3 pinions, 4 feet diameter, 8 arms and 16 inches face; 12 inches+8 feet shafts, 12 inches+8 feet long, and one 12 inches+5 feet do.; 2 cast-iron drums, 12 feet diameter, 8 arms, 4 feet face; 16 feet fly-wheel, 8 arms, 5+9 rim; link movements; teeth 4 inches deep, 5½ pitch; a 40 horse breaker engine, 16 inches+4 feet cylinder; 16 feet wheel, 8 arms, 5+8 rim; 2 pulley-wheels, one a 14 feet and one a 12 feet diameter; 300 feet 20 inch belts; 13 boilers, 34+30=390 feet; grate area, 169 square feet; water steam at 80 pounds; no indicator; all of the above machinery and engines are substantial in all their appointments; a saw mill attached of a first-class capacity; 1,400 feet 1¼ inch wire ropes, one steel and one iron wire.

Remarks.—I measured the air and found it 13 times slow; it wants a door at every fourth breast, and the headings cut 36 square feet.

No. 135.—Tamaqua Colliery.

Inspected June 7, 1869.

Description.—I submit herewith a detailed statement of the above named mines as herein set forth. The colliery is located on the north of Tamaqua, 18 miles east of Pottsville, and west of the Little Schuylkill river, on the coal lands of the Tamaqua coal company, leased and operated by Eugene Borda. The colliery consists of two drifts, running in west; the veins are classified or lettered; the mines are well managed, but not until a slope is sunk, it will become a place of importance; the veins of this section of the coal region inclines with the curve of the mountains, and the valley is here narrowed to one-half mile; the veins gradually lose their thickness at Tamaqua, and regain it as they get beyond the Schuylkill river eastward.

Gangways.—The A vein gangway is in 1,650 feet, and the coal 16 feet thick; this is the Mammoth vein, and dip south 70°; the breasts 27 feet wide; the pillars 12 feet thick. C vein gangway is in 2,100 feet; this vein is 12 feet thick, and dip south 70°; these breasts are 30 feet wide, and the pillars 16 feet thick; all the breasts run up 150 feet; 16 breasts working in the mine at present.

Ventilation by air-holes out to the surface; the gangways are intakes and check doors on the gangways, drives the air up into the working districts, and thence pass through the cross headings out to the air-holes on the surface; very little gas of any sort to be met with at present, and have not received any complaints from the miners; a 40 horse engine runs the breaker and hoists the coal on the plane; 3 boilers, 30+30 feet long; grate surface, 42 square feet; all the dangerous places are well secured, and every attention paid to the comfort of the hands; the plane is 100 feet long, with two tracks in it; 250 feet $1\frac{1}{8}$ inch wire rope in use; the water is good, and the boilers examined once or twice a year; carries 60lbs of steam.

Remarks.—The company contemplate sinking a slope, in short, and in that event are to erect a good steam fan, and make all other necessary improvements required by the new law.

Recapitulation.—One 40 horse breaker engine; 3 boilers, 30 inches+30 feet long=90 feet; incline plane, 100; area of grate, 42 square feet; 2 gangways, 3,750 feet long; 600 feet outside tracks; total track laid, 4,550 feet T rail=$\frac{7}{8}$ mile=$34\frac{1}{3}$ tons, nearly; 240 feet 1 inch wire rope; 1 visit, 36+2=38 miles; 12 breasts, 30+200+16 and 12 feet thick; 2 veins dip south 60° to 70°; 18 feet pillars; no furnace or fan; 80 persons employed; outside temperature, 78°; ditto inside, 52°; killed, none; injured, none; 10 mules; 35 wagons; air, $5\frac{1}{4}$ times slow; no gas; 7 per cent. acid in water. Officers: Robert Cushaw, agent; Augustus Rauch, boss miner. Condition of breaker and mines, good; drainage, not very good, but are improving its condition very much; shipping capacity, 35 cars per day; could ship 50 cars per day.

No. 136.—Koh-i-noor Shaft.

Inspected.

Description.—I herewith submit a detailed statement of this great shaft, which is located on the Gilbeton estate, leased and operated by Richard Heckscher & Co.; it is situated one-fourth mile west of Shenandoah City, and approached by the P. and R. R. R. branch track; it lies 34 miles north-

east of Pottsville by rail and 23 do. by pike road. This colliery consists of a mammoth shaft, already sunk 255 feet to the Mammoth vein, which was found to be 44 feet thick; the shaft is to penetrate the basin, from the bottom of which will radiate several gangways driven out to the boundary line of the track; here mining will be commenced and air furnished for that purpose by a powerful steam fan of 30 horse power, 20 feet diameter; area of its paddles, 30 square feet=180 square feet section. The internal and external operations will be conducted on an entirely new principle, altogether unknown in this country; the use of expensive pumps will be done away with and self-loading cages by which the coal and water will be brought to the surface without the necessity of any attendance at top or bottom, having a capacity of delivering 1,200 tons per day of ten hours; by this means the coal will be washed first and crushed or manufactured at the surface, unlike the common way at a high elevation, which subjects the frame buildings to great strain; the coal, when broken, will be raised by elevators to the screens and there separated to each respective size. The whole plan is taken from the only two such working shafts in Durham Co., England, and is now introduced by Mr. Heckscher at his Koh-i-noor colliery, in this county. He has likewise introduced the Gerner steam boiler, of five feet diameter in one and three feet do. at the other end, an interior steam cylinder, enveloped by water, which receives the steam generated, claims for its superior safety that the explosive tendency is inward, contra to the ordinary boiler now in use. The shaft is sunk through two other veins, and in its course pierced 82 feet thick of a bench of pure conglomerate rock, a thing altogether unusual in this county; the blasting process is performed by nitro-glycerine, (not by powder,) which largely contributed to hastening the sinking, as by the use of powder it would require double the time and expense and much more safer; the rope in use is a 6 inch plated steel wire rope, best English make; straining power 120 tons; every thing connected with the establishment deserves remark, as it is thoroughly strong and safe in all its appointments.

Engines.—One 30 horse fan engine, 16 inch+33 inch cylinder; a 75 horse breaker engine, 19 inch+5 feet cylinder; 2 shaft engines, 20 inch+4½ feet cylinders, equal 50 horse each=100; 2 cast iron drums, 19 feet diameter, each 10 arms, having 8 inch rope flanges; 2 19 feet cog wheels, 10 arms each, mounted on same shaft, 14 feet face, teeth 4 inches deep; two 5 feet pinions, 6 arms, 14 inch face, which gives motion to the drums; shafts, 17 inch wrought iron, one 14 inches, 8 feet, and one 14 inches+10 feet; a 6 horse feed pump, double acting; only 4 boilers used; as above described the 4 engines are=211 horse, all secured in the same engine house; 4 breaker boilers, 34+30 feet, 120 feet, and 4 shaft ditto, 60+30+30 feet=120, thus 8 boilers=240 feet long; area of grate=130 square feet; the veins dip 20° north and south.

Recapitulation.—The shaft will be 350 feet deep; section area, 24+12 square feet; 4 engines=211 horse power; 8 boilers=240 feet; grate surface, 130 square feet; 800 feet 6 inch plated wire rope; one 30 horse steam fan; one saw-mill; 350 employees; 10 mules; 100 wagons; capacity of shaft, 3,000 tons per day; shipping capacity, 1,200 tons; a safety road for man and animal separate, none to pass up or down the slope; air-shaft entirely independent of shaft, and each pillar holed three times its length up, with the upper heading at the top of the breasts, and when finished this will form an air course to carry off all bad air in the old works should they contain any gas; then take the air through the centre gangway, put a door on the west gangway and drive the air to the first breast on the east counter gangway; air this work, head through the air-hole pillar and door

it where needed, and allow the air to pass off to the surface; thus ventilate the counter works, east side; put double check doors on the lower gangway, and close battery all the schutes with canvas on the draw-holes and keep the fan in good motion and the ventilation will be correct. N. B.—The fan should be located on the eastern counter air-hole after it is holed out to the surface of a proper section area.

Recapitulation.—Distance, 31 miles; 1 visit, 62+2=64 miles; temperature, 24° inside; ditto 54° outside; coal slope, 610 feet deep; 4 tracks; 1 lift; 3 veins, 45 feet thick; 3 gangways=5,250 feet; area 71 square feet; 25 breasts, 30 feet+180 feet; 18 feet pillars; one 20 horse steam fan, 17 feet diameter; 4 outcasts; 1 intake; 5 engines, 300 horse power; 13 boilers, 34 inches+30 feet=390 feet long; grate surface=169 square feet; 1,400 feet wire ropes, $1\frac{1}{4}$ inch; 1 plane outside, 240 feet; outside track, 2,700 feet; 4 slope tracks=2,440 feet, and the inside ditto=5,250 feet; aggregate tracks laid, 10,390 feet T rail, 48 inches gauge, 25lbs rail, 2 miles =79 tons; 10 per cent. acid water; 5 per cent. black damp; none killed or injured; 158 employees; 17 mules; 50 wagons; 6 escape roads; a good colliery. Officers: C. L. White agent; John Powell, boss miner; John Herrington and Patrick Mooney, first engineers.

No. 137.—East Shenandoah Shaft.

Davis, Kindrick, Dovy & Co.—January 15, 1870.

Description.—This shaft is commenced sinking on the eastern limits of Shenandoah City, on the Primrose vein, which was reached at 10 feet, and is continued on to the Mammoth, 80 yards deeper; the measures have been bored to and proven; the firm employs 30 hands and 2 mules; one 20 horse engine; 2 boilers, 30 inches+20 feet; 3 veins, the Primrose, 9 feet; the Seven-feet, $7\frac{1}{2}$ feet, and the Mammoth, 44 feet=61 feet thick of coal, and at prssent not much doing; there are 6 safety lamps always needed; the breasts are 30 feet, 48 feet, and the pillars 18 feet thick; the fan power pulley is but 3 feet diameter, and the small one but 20 inches; a considerable body of carburetted hydrogen gas is evolved in the east gangway.

Recapitulation.—One shaft, 300 feet deep: section area, 18+6+108 sq. feet; 400 yards $1\frac{3}{8}$ inch wire rope; 3 engines, 56 horse power; 4 boilers= 104 feet long; area of grate surface, 48 square feet; one visit, 18 miles; 4 years in operation; temperature outside, 18°; inside ditto, 51°; difference, 33°; number of lift, 1; 1 track; 1 vein, 6 feet thick; number of gangways two, 2,400 feet; outside track, 1,800 feet; 4,200 feet T rail, 40 inches gauge, 25lbs rail; a small 6 horse steam fan; killed, none; injured, 3; 80 persons employed; 1 mule; 13 wagons; shipping capacity, 10 cars per day; 4 breasts working.

No. 138.—Big Mine Run Colliery.

Inspected December 31, 1869.

Description.—This colliery is located 2 miles east of Ashland and 15 miles north of Pottsville, on the west side of the creek near the Mine Hill planes, passing on to Centralia, in Columbia county, on the estate of John

Anspach, Jr., of the Locust Mt. coal and iron company; leased and operated by Gideon Bast, Esq., from its first commencement in 1852. The colliery consists of a slope and drifts. The slope is sunk on the south dip of the Mammoth vein 525 feet deep; its section area is 20+18+8=152 square feet; 2 tracks of 44 inch gauge, 25lb. rail, and a pump track. All the gangways of this colliery run in west and are very extensive work and a large producing mine. Mr. Bast has the credit of being one of the oldest successful operators in the county, and always managed his mines with great regularity, giving very little cause for complaints, and interested himself in the proper security of the miners and stability of his mines.

Ventilation.—The mines are ventilated by a powerful Beadle steam fan ventilator, located at the western limits of his gangways, using the slope for a downcast, thus giving the fan perfect control of the air traversing the mines, which is under the influence of check-doors on the different gangways, which changes the air currents into the working districts, carrying off with it all the deliterious elements engendered in the mines, and all necessary precautionary measures taken for the protection to the miners' lifes. We have known Mr. Bast to be one of the most indefatigable and cautious men in the trade, and always aims at excellence in the security of his mines and miners; although a man far advanced in years, is now full of activity and of a business capacity, almost constantly employed.

Gangways.—Four gangways equals 14,400 feet; the 4 drifts on the colliery, one of which is nearly worked out; they all are in open ground; the Columbia county line closes the tract on the northern quarter; 30 breasts of 30 feet+240 feet long, are working on the colliery; the pillars 24 feet thick, and holed through in four places each; 1,700 feet outside tracks—total length of T rail laid is 16,100 feet=3 miles=118 tons; pluss planes, &c., 20,790 feet.

Engines.—Two 50 horse engines in use at the slope; 4 boilers, 34 in.+36 ft.; 2 incline plane ropes, 1,332 ft., 1¼ inch; a slope rope, 1,150 feet, 1½ inch; an outside plane, 620 ft. of 1 inch rope=2,000 ft. long—in all, 4,482 feet; one 30 horse breaker engine; 3 boilers, 34 inches+30 feet; a 50 horse dirt plane engine; 4 boilers, 34 inches+30 feet long; a 20 horse fan engine; 2 boilers, 34 inches+30 feet; a 60 horse double acting steam pump, located 600 yards west of the slope, in the Little Mine Run creek; 5 large water tanks on the premises, aggregate capacities=22,000 cubic feet—in all, 6 engines=260 horse power; the steam pump has 6 boilers attached to it, 34 inches+30 feet=510 feet long; areas of grate surface, 234 square feet.

Recapitulation.—Two visits, 60 miles+3 in mines=63 miles; 16 years in operation; temperature outside, 27°; inside, 51°; difference, 24°; 4 drifts; 1 slope, 525 feet deep; 3 tracks, 44 inches gauge, 25lbs rail; 2 veins, Skidmore 14 feet, the Mammoth vein 25 feet=39 feet thick; 4 gangways, 14,400 feet long; 1,700 feet outside tracks; 1,050 feet slope tracks=17,150 feet of T rail=3¼ miles=128 tons; 30 breasts, 30+240 feet; 24 ft. pillars; 1 downcast air-course; 4 outcast safety roads; one 20 horse steam fan; 6 engines =260 horse power; 17 boilers=510 feet long; 234 square feet grate surface; 4,482 feet wire ropes in use; 2 planes, 600 feet each; 1 outside ditto, 620 feet long; the 3 planes each 2 tracks, 1,820 feet each=3,640, add to the total length and it will make 20,790 feet of T rail, 4 miles nearly=156 tons; killed or injured, none; 320 employees; 16 mules and 70 wagons; 7 per cent. gas, carburetted hydrogen; 10 per cent. acid water; 5 large water tanks; condition of colliery favorable; no complaints for want of air.

TABULATED RESULTS.

No.	NAMES OF COLLIERIES.	LOCAT'NS OF COLLIERIES.	NAMES OF LAND OWNERS.	NAMES OF OPERATORS.	Distance to and back.				
					Distance.....	No. of visits.....	By railroad	By pike road....	Total miles traveled.....
1	St. Clair Shaft	St. Clair	H. C. Carey	John C. Northall	.....	3	.....	30	30
2	Wadesville Shaft	Wadesville	Maj. Wetherel & Co.	Wm. Draper	....	3	.....	27	27
3	Glenworth	Eagle Hill	Matison & Beaber.	J. P. Ryan	.....	4	.....	32	32
4	Tunnel Slope	Ashland	J. P. Brock & Bro.	Patterson & Co	.....	8	.....	216	216
5	Colorado	Seitzinger's Patch	Girard heirs	Cake & Co	.....	4	74	112	186
6	Lost Creek	Lost Creek	Do	Do	.....	1	.....	2, 38	40
7	Girard	Girardsville	Do	J. J. Conner	....	3	74	73	147
8	Pioneer Slope	Ashland	J. P. Brock & Bro	Bancroft, Lewis & Co	.....	8	.....	218	218
9	Preston, No. 2	Girardsville	Girard heirs	Buckley & Moody	.....	3	76	64	140
10	Peach Mountain	Ravendale	R. W. Lewis	G. D. Whitlesy	.....	1	.....	13	13
*11	Tamaqua	Tamaqua	Tamaqua coal company	Whetstone & Wood	.....	3	.....	112	112
12	Hartford	Mahanoy City	Patterson heirs	Wm. Patterson	.....	2	124	.....	129
13	Delano	Do.....East	Delano coal company	Gorman & Co	.....	1	62	.....	62
14	Norton	Do.....North	Do.....do.	Bedford, Cox & Co	.....	1	66	2	68
*15	Shenandoah	Shenandoah City	J. P. White & Co	J. O. Rhoades	.....	1	71	3	74
16	Thomas	Do.....North	Philadelphia city	J. Wasley & Co	.....	2	71	.....	71
17	Plank Ridge	Do.....East	Do	Wm. Grant & Co	.....	2	.....	134	134
18	Preston, No. 3	Girardsville	Dr. Preston heirs	H. A. Moody	.....	2	75	36	111
19	Black Heath	Taylorville	York and Schuylkill co.	J. Maginnis	.....	2	.....	2, 44	46
20	Furnace	Gilberton	J. Gilbert	Atkins & Bros	.....	1	69	.....	69
21	Glen Carbon, West	Glen Carbon	Richard and Webster	Lucas, Dunnings & Co	....	2	.....	43	43
22	Do...New Slope	Do	Do.....do.	Do .....do	....	1	.....	22	22
23	Do...Peaked Mountain	Do	Do.....do.	Do .....do	.....	1	.....	24	24
24	Mammoth	Shanandoah, West	John Fry	Wm. L. Williams	....	2	68	70	138
25	Eagle Hill Shaft	Eagle Hill	Mattison & Co	J. C. Oliver	....	3	.....	39	39
26	Windy Harbor Shaft	Windy Harbour	David Oliver	Guitterman & Co	....	1	.....	10	10
27	Phœnix, No. 1	Phœnix Park	Packard & Co.	Morgan Williams	.....	1	.....	2, 12	14
28	Do..... No. 2	Do	Do	Johnson & Dovy	.....	1	.....	16	16

29	Phœnix, No. 3	Phœnix Park	Packard & Co	Do. now idle		1	14	14
30	Maple Dale	Maple Dale	Dundas & Co	John Beach, agent		3	66 10,96	172
31	Pine Forest Shaft	Near St. Clair	Major Wetheril	G. W. Snyder		2	23	23
32	Otto, No. 1	Forestville	Forest improvement co	Cain, Hacker & Co		1	20	20
33	Do. No. 2	Do	Do do	Do do		1	16	16
34	Do. No. 3	Do	Do do	Do do		1	16	16
35	Swatara, No. 1	Swatara coal company	Swatara coal company	Claud White, agent		1	21	21
36	Do. No. 2	Do do	Do do	Do		1	21	23
37	Do. No. 3	Do do	Do do	Do		1	23	23
38	Newtown Slope	Newtown	Helfenstine & Co	G. Koll & Co		1	21	22
39	Beatty's Shaft	P. and R. R. R. planes	Girard heirs	James Beatty		2	68	71
40	Hunter, No. 4	Girardsville	Do	H. A. Moody		2	74 36	110
41	Lawrence Slope	P. and R. R. R. planes	J. Gilbert	J. Lawrence		2	72	72
42	Silver Brook	Silver Brook	Silver Brook coal co	Hosea & Longstreet		1	3,56	59
43	Honey Brook Slope	Honey Brook	Honey Brook coal co	Jno. B. M'Creary		1	60	62
44	Do do	Do	Do do	Do		1	60	62
45	Do do	Do	Do do	Do		1	66	63
46	Heckscher Slope	Heckscherville	Manhattan coal comp'y	J. Wadlinger		2	24	29
47	Mt. Pleasant	Mount Pleasant	York and Schuylkill co	H. A. Shollenberger		2	40	43½
48	Greenwood	Tamaqua, East	Lehigh coal company	E. Borda & Co		1	38	45½
49	Bull Run	Do	Pardee & Co	Do		1	40	43
50	Do No. 10	Do	Do	Do		1	40	44
51	Mammoth Shaft	Tamaqua, South	Do	Do		3	36 3,72	111
52	High Mines	Do North	Do	Do		3	72 6,36	114
53	Beaver Run Drift	East Mahanoy	Delano coal company	Bowman & Co		1	66	66
54	St. Nicholas	St. Nicholas	Philadelphia coal co	E. D. Denison		2	128	133
55	Hill & Harris	North Mahanoy	Delano coal company	Hill & Harris		2	125	125
56	Primrose	Do	Kear & Patterson	Nevils & Bros		1	67	67
57	Middie Creek	Middie Creek	Tremont coal company	Tremont coal company		1	30	30
58	Do No. 2	Do	Do do	Do do		1	36	36
59	Do No. 3	Do	Do do	Do do		1	34	34
60	Donaldson Slope	Donaldson	Do do	Do do		1	32	32
61	Do No. 2	Do	Do do	Do do		1	32	32
62	Do No. 3	Do	Do do	Do do		1	36	36
63	Tremont	Do West	Do do	A. Ettien		1	38½	38
64	Swatara	Do do	Swatara coal company	Nutting & Lewis		2	75	75
65	Brookside	Williams Valley	Monson & Williams	Savage & Co		1	54	54
66	Tower City	Do	Do do	Savage & Althouse		1	50	50
67	Rauch Creek	Rauch Creek, West	G. B. De Keim	H. Heil		2	74	74
68	Do	Do South	Do	H. Graff & Co		2	74	74
69	Do	Do do	Do	Do		1	41	74
70	Mammoth	West of Rauch Creek	Smalley	Osterman, agent		2	179	79
71	Pott's Slope	Wolf Creek	J. P. Brock & Bro	G. H. Potts & Co		1	15	15

TABULATED RESULTS—CONTINUED.

No.	NAMES OF COLLIERIES.	LOCAT'NS OF COLLIERIES.	NAMES OF LAND OWNERS.	NAMES OF OPERATORS.	Distance to and back.				
					Distance.....	No. of visits.....	By railroad	By pike road....	Total miles traveled.....
72	Kear Slope.....	Wolf Creek.....	J. P. Brock & Bro	Kear, Confer & Co	.....	1	.....	10	10
73	Mine Hill Gap	Mine Hill Gap	Barker & Co	Idle	.....	1	.....	11	11
74	West Mount Laffy.....	Do.	Patterson & Co.....	Just sunk.....	.....	1	.....	11	13
75	East Pine Knot.....	Greenberry Valley	.....	Maj. Baldwin, agent.....	.....	1	.....	15	15
76	West..... do.....	Do.	.....	Do.	.....	1	.....	15	15
77	Manhattan Shaft.....	Heckscherville	Manhattan coal comp'y..	J. Wadlinger..	.....	1	.....	6, 16	22
78	Kear's Slopes.....	M. H. Gap, North.....	.....	Tom and Wm. Kear.....	.....	1	.....	17	17
79	Preston, No. 1	Girardsville.....	Buckley & Moody	Buckley & Moody	....	2	.....	37	40
80	Ledger Vein.....	Silver Creek	Philadelphia Ledger co ..	E. C. Whitlesy.....	.....	1	.....	18	22
81	Silver Creek.....	Do.	.....	Murry, W. & Co	.....	2	.....	18	21
82	Beach Wood.....	Mt. Laffy.....	Wadesville shaft co.....	J. K. Siegfried	.....	2	.....	10	18
83	Revenue.....	Do.	Do .....do.....	G. H. Potts & Co.....	.....	1	.....	13	13
84	Dexter	Do..	.....	Russell, Evans & Co.....	.....	1	.....	12	12
85	Duncan.....	Duncanville	Duncan coal company ...	Duncan coal company ...	.....	1	.....	7	7
86	Crist Frans	Wadesville	Wetneril & Co	Crist Frans.....	.....	1	.....	8	8
87	Do.	Do.....North	Do	Do.	.....	1	.....	8	8
88	Saylor Slope.....	Do.....West.....	Do.	Saylor & Co.....	.....	1	.....	10	10
89	Boston and Mahanoy	P. & R. R. R. planes, north	Boston & Mahanoy c'l co.	B. and M. coal company,	.....	2	72	46	118
90	Boston Run.....	Philadelphia City Run...	Philadelphia City tract...	Buck & Althouse	.....	2	70	48	118
91	Draper.....	P. & R. R. R. planes, east.	Do ..... do	Wm. Draper	.....	2	70	42	112
92	Cleaver.....	Ashland, North.....	J. P. Brock & Bro.....	Jas. Cleaver & Co.....	.....	2	.....	54	55
93	Bowen	Do.	Do.	Jas. Bowen & Co...	.....	2	.....	54	54
94	Suffolk	St. Nicholas.	Dundas & Co	Mahanoy & Phil. coal co..	1	2	.....	134	134
95	Kaskawilliam	Middleport, West.....	Hiester Clymer..	P. D. Luther & Co	17½	1	.....	22	24
96	Jonson's.....	Tamaqua, South	Pardee & L. C. co.....	John Jonson.....	17½	1	.....	35	36
97	Kentucky	Tuscarora, West.....	Kentucky coal comp'y...	Donohoe & Schall.....	11	1	.....	25	25
98	Swift Creek.	Do.....South.....	Bast & Co.....	Van Winkle & Co.	.....	1	23	2	25
99	Swift Swamp.....	Do.....do.....	Do	Robottham & Co	.....	1	23	.....	26

100	Knickerbocker	Waste House Run	Knickerbocker coal co...	Knickerbocker coal co...	1	58		58
101	Barry	Do East	M'Neill coal company...	M'Neill coal company...	35	1	70		70
102	M'Neill	Do West.	Do do.	Do do	37	1	67		67
103	Do No. 2	Do do.	Do do.	Do do	37	1	67		67
104	Silliman	Mahanoy, North	Dundas & Co	E. S. Silliman	30½	1	61		66
105	Boylen's	Do do	Do	Boylen & Co	31	2	131		131
106	East Mahanoy	Do do	Delano coal company	Wm. R. Williams & Co.,	32	2	131		131
107	Copely	Do East	Stephenson & Co	Lentz & Bowman	32½	1	65	2	67
108	Sherman	Do do	Delano coal company	Eschelman & Co	33	1	68	2	70
109	Trenton	Do do	Do do	Mercer coal co. of N. J	34	1	70		70
110	Grant	Do do	Do do.	Eschelman & Co	28	1	56	2	58
111	Union	Big Mine Run	J. P. Brock & Bro	Emanuel Bast	15	1, 2	82	60	142
112	Gilberton	Gilberton, North	John Gilbert	Mahanoy & Boston C. C.	34	2		109	109
113	Keystone	Locust Dale	J. P. Brock & Bro.	Wm. Kendrick & Dovy,	15	2		66	66
114	New Castle	New Castle	Pott & Banman	Geo. S. Rippler	5	2	2	10	14
115	Spruce Forest	Do East	Richardson	Lucas, Denning & Co	5½	1		10	12
116	Eagle	St Clair	Do	G. W. John & Bro	3½	2		20	20
117	Commercial	Silver Creek	Valley Furnace	Gideon Bast & Co	9	3		54	54
118	Girard Mammoth	Raven Run	Girard heirs	John Donaldson	19	1		41	41
119	Schuyler	Do	Do	Heatton & Bros	19	1		42	42
120	Wm. Penn	Lost Creek	Philadelphia City tract	E. S. Griscom	21	1		44	44
121	Tunnel Ridge	Mahanoy, West.	Do do.	G. W. Cole	30	1	65		65
122	Wiggans & Co	St. Nicholas	Do do	Wiggan & Trebles	32	1	32		32
123	Lorberry Slope	Lorberry	Lorberry coal company,	Lorberry coal company,	36	1	72		74
124	New Philadelphia	New Philadelphia	Valley Furnace	Gay & Hines	9	1	18		18
125	Turkey Run	Shamandoah City	Philadelphia City tract	John son & Dovy	23	1	46		48
126	Coal Ridge	Middleport		H. Guitterman	10	1	21		21
127	Forestville Slope	Forestville	Manhattan coal comp y,	John Wadlinger	6	1		14	14
128	Diamond	Do	Do do.	Goodman Dolbin	6	1		14	14
129	Buckville	Buckville.	Tamaqua company	Eugene Borda	16	1	32	1	33
130	Reevesdale	Reevesdale	Do	Thomas Mays & Co	16	1	32	1	33
131	New Kirk	New Kirk	Do	Tamaqua company	16	1	32	1	33
132	Reevesdale	Reevesdale	Pardee & Co	Jas Glenn & Co	16	1	32	1	33
133	Pardee and Roberts	Tuscarora, South	Do	Pardee & Co	14	1	28	1	29
134	New Boston	New Boston	Delano tract	New B oston company	31	1	62		64
135	Tamaqua	Tamaqua	Tamaqua, North	Robert Cushaw, agent	18	1	36		38
136	Koh-i-noor Shaft	Shamandoah City	Philadelphia city	Rich'd Heckscher & Co	36½	1	73		73
137	New Shaft	Shanandoah, East	J. P. White & Co	Kendrick, Davies & Dovy	36	1	72		72
138	Big Mine Run	Big Mine Run	John Anspach, Jr.	Gideon Bast, Esq	15	2			63

TABULATED RESULTS—CONTINUED.

No.	Condition.		Temperatures.			Sort of colliery worked.						Coal veins.*			Gangways.				
	Years in operation	D, (dry,) W, (wet,)	Outside, (deg.)	Inside, (deg.)	Difference	No. of drifts	No. of shafts	No. of slopes	Section area in square feet	Feet deep	No. of lifts	No. of tracks	No. of veins	Thickness coal	Dip, degrees	No. gangways	Section area	Length in feet	Feet to boundary line	Total length in feet
1	10	D	72	61	11	.....	1	.....	380	620	1	2	2	30	23	23	66½	47,520	1,200	48,720
2	4	D	83	68	15	.....	1	.....	336	666	1	2	2	30	14	20	66½	34,320	.....	34,320
3	10	D	60	62	2	.....	.....	2	150	602,602	3	4	3	24	30	6	60	15,850	.....	15,500
4	12	D	66	66	.. ..	....	.....	1	375	768	3	2	1	60	66	2	67	2,250	2,600	4,850
5	8	D	82	50	32	2	.....	.....	68	.....	.....	2	3	40	25	6	60	15,300	5,760	21,060
6	2	D	82	52	30	.....	...	1	198	360	1	4	5	82	65	3	66	4,200	5,760	9,960
7	8	D	62	68	6	6	.....	.....	64	.....	3	6	3	74	30	6	64	17,872	.....	17,872
8	16	D	72	66	6	3	.. ..	1	150	534	4	4	1	60	65	4	66½	30,794	1,200	31,994
9	6	D	88	54	34	.....	.....	1	198	249	1	4	3	50	40	4	63½	8,137	.....	8,137
10	4	.. ..	72	56	16	.....	.....	2	164	900,380	2, 1	4	3	24	36	4	63	8,349	.....	8,347
11	10	W	70	64	6	.....	.....	1	158	312	1	4	2	20	56	4	66	8,640	.....	8,640
12	10	D	61	48	13	2	.....	.....	63	.....	....	2	4	40	30	4	63	9,570	.....	9,570
13	10	D	74	59	15	1	.....	.....	.....	.....	.....	1	1	20	30	1	63	1,920	.....	1,920
14	4	D	74	62	12	2	.....	.....	66	.....	....	2	1	20	35	2	66	4,227	.....	4,227
15	8	D	71	50	21	....	.....	1	176	772	1	4	1	60	20	6	76	16,700	... .	16,700
16	2	D	76	56	20	6	.....	1	166	390	1	2	1	42	33	5	76	4,350	....	8,000
17	6	D	70	52	18	.....	1	.....	160	300	1	1	1	30	28	3	66	3,000	.....	3,000
18	12	D	72	67	5	2	.....	1	176	249	1	2	2	32	45	4	64	8,732	.....	8,732
19	6	D	78	54	24	...	.....	1	221	285	1	4	1	26	45	2	64	4,200	.....	4,200
20	1	D	73	61	12	2	.....	.....	63	.....	....	2	1	12	35	4	63	600	3,600	4,200
21	15	D	71	52	19	.....	.....	2	440	600,300	2, 1	4, 4	3	28	56	6	66	28,800	.....	28,800
22	[illegible]	D	72	50	22	.....	.....	1	264	600	1	2	3	28	56	.....	.....	1,000	....	.....
23	[illegible]	D	82	56	26	.....	2	.....	192	300,600	1	2	5	32	36	4	66	8,730	1,500	10,230
24	6	D	72	46	26	2	.....	.. ..	54	.....	.....	3	5	32	42	3	54	3,000	7,600	10,600
25	24	D	69	66	3	.....	1	2	1,034	257,450,327	2	7	2	23	42	7	60	6,172	5,280	11,452
26	24	D	69	56	13	.....	.....	2	205,210	270,458	1, 2	4, 2	4	42	70, 40	6	60	4,410	6,800	11,210
27	25	D	82	52	30	... .	.....	1	152	975	3	4	4	29	22	6	60	6,860	.....	6,860
28	20	D	80	56	24	.....	.....	1	220	607	2	4	2	25	34	8	66	10,560	....	10,560

29	2	W	....	80	.....	.....	....	.....	1	157	585	1	2	1	12	27	2	66	1.245	36,000		37,245	
30	9	W	D	82	51	31	5	.....	....	65	....	.....	10	5	48	13	8	65	13,270	.....		13,270	
31	4	...	D	71	68	3	...	1	....	73	300	....	2	2	40	35	3	67	7.541	.....		7,541	
32	6	.....	D	80	71	9	....	.....	1	66	750	2	4	3	36	22	6	66	11,955	.....		11,955	
33	1	.....	D	80	68	12	1	.....	1	66	720	2	4	3	36	31	4	66	7,440	....		7,440	
34	10	.....	D	80	69	11	1	...	1	56	720	2	4	3	36	28	4	66	7,920	....		7,920	
35	15	.....	D	70	68	2	1	.....	1	54	570	2	4	4	35	45	6	66	15,390	....		15,390	
36	10	.....	D	72	58	14	1, 1	.....	1	114	195	1	2	2	16	28	2	56	10,200	1,800	1,800	10,200	
37	10	...	D	76	55	21	1	...	1	156	150	1	2	2	16	30	6	54	4,260	1,800		6,060	
38	2	W	....	76	46	30	.....	.....	1	196	300	1	1	1	6	80	2, 2	52	4,425, 930	....		5,355	
39	8	.....	D	91	54	37	....	1	.....	156	124	1	2	2	26	46	6	64	10,323	5,100		15,423	
40	10	.....	D	78	52	26	2	.....	.....	66	....	.....	2	2	40	70	3	66	7,692	....		7,692	
41	½	.....	D	78	52	26	.....	....	1	66	351	1	4	2	40	56	2	66	2,040	10,540		12,580	
42	9	W	.....	72	50	22	.....	1	.....	240	140	1	3	3	44	30	3	52	380, 4,980	7,410	380,	12,390	
43	12	....	D	62	54	8	.....	.....	1	186	240	1	3	2	46	48	4	66	6,690, 6,600	To line		13,290	
44	10	.....	D	69	54	15	.....	.....	1	186	300	1	4	2	46	48	5	66	6,610	of tract,		6,610	
45	4	.....	D	72	56	16	.....	.....	1	186	279, 540	3	6	2	46	48	5	66	3,915	3, 150 ft.		3,915	
46	12	.....	D	83	52	31	.....	.....	1	176	540	2	5	5	50	55	14	52	43,491	.....		43,491	
47	6	.....	D	84	58	26	....	.....	1	189	780	2	4	3	36	50	4	64	12,525	.....		12,525	
48	8	.....	D	74	66	8	.....	.....	1	250	840	2	4	1	14	54	4	66	12,600	.....		12,600	
49	1	.....	D	74	71	3	.....	.....	1	348	685	2	4	5	132, 44	55	4	63	10,500	13,200		23,700	
50	4	.....	D	73	52	21	1	.....	.....	67	....	.....	2	1	85	51	2	63	6,300	17,600		6,300	
51	8	.....	D	78	62	16	.....	1	.....	128	364	1	2	4	38	85	4	60	18,366	....		18,366	
52	12	W	.....	73	48	25	2	.....	.....	50	....	.....	2	2	18	40	4	50	3,600	.....		3,600	
53	½	....	D	80	47	33	1	.....	.....	54	....	.....	1	1	9	22	1	54	600	2 miles.		600	
54	8	.....	D	74	58	16	.. ...	.....	1	318	366	1	4	6	69	50	3	63	14,160	.....		14,160	
55	10	.....	D	80	72	8	3	.....	1	240	366	1	4	5	64	25	7	66	14,760	.....		14,760	
56	8	W	.....	80	52	28	1	.....	.....	54	....	.....	3	2	20	18	2	54	18,150	.....		18,150	
57	12	.....	D	79	66	13	.....	.....	1	63	121	1	4	3	20	50	2	63	8,232	.....		8,232	
58	10	.....	D	78	55	23	.....	.....	1	48	400	2	4	4	15	45	2	48	10,230	.....		10,230	
59	8	.....	D	80	56	24	1	.....	1	66	465	2	4	5	15½	45	3	66	18,207	.....		18,207	
60	16	.....	D	61	58	3	.....	.....	1	63	492	2	4	3	53	51	4	63	6,600	.....		6,600	
61	10	.....	D	68	66	2	.....	.....	1	178	591	2	5	3	53	51	5	63	11,160	.....		11,160	
62	4	.....	D	66	63	3	.....	.....	1	63	690	4	12	3	53	51	12	66	21,180	.....		21,180	
63	6	.....	D	60	62	2	2	.....	.....	63	....	....	4	3	31	70	4	63	6,810	.....		6,810	
64	1	.....	D	62	62	.....	.....	.....	1	184	321	1	4	4	35	25	2	66	4,980	.....		4,980	
65	1	.....	D	62	64	2	.....	.....	1	240	450	1	4	1	12	50	2	65	432	.....		432	
66	1	.....	D	63	62	1	.....	....	1	246	255	1	4	1	12	56	2	65	75	.....		75	
67	11	.....	D	68	60	8	.....	.....	2	176, 176	690, 360	2, 1	8	4	37	33	12	65	47,580	.....		47,580	
68	14, 1	.....	D	70	66	4	.....	.....	1	180	801	2	4	2	20	51	5	67	18,960	.....		18,960	
69	12	.....	D	70	52	18	.....	.....	1	168	420	2	4	2	20	22	2	67	2,442	.....		2,440	
70	4	.....	D	76	46	24	.....	.....	1	138	420	1	4	4	35	80	4	58	4,410	.....		4,410	
71	26	.....	D	76	58	18	.....	.....	2	176	600, 1,443	5	4	4	32	33	20	64	50,151	.....		50,151	

TABULATED RESULTS—CONTINUED.

No.	Condition.			Temperatures.			Sort of colliery worked.						Coal veins.			Gangways.				
	Years in operation	W, (wet,)	D, (dry,)	Outside, (deg.)	Inside, (deg.)	Difference	No. of drifts	No. of shafts	No. of slopes	Section area in square feet	Feet deep	No. of lifts	No. of tracks	No. of veins	Thickness coal	Dip, degrees	No. gangways	Section area	Length in feet	Feet to boundary line	Total length in feet
72	29		D	74	49	25			1	178	1,520	5	4	3	27	33	2	66	5,100		5,100
73	34	W		78					1	186	840	3	4	3	42	30	2	66			
74	15		D	78	44	34			1	180	960	2	4	3	32	16½	3	64	12,870		12,870
75	20		D	61	60	1			2	176	5,705	2	4	4	32	45	3	67	5,721		5,721
76	30		D	73	66	7			1	176	711	2	4	3	59	33	6	63	8,544		8,544
77	15		D	76	54	22		1	1	286	252	1	2	5	59	36	6	66	36,642		36,642
78	20		D	76	68	8			2	152,176	603,900	3	4	5	114	50	10	67	28,746		28,746
79	10		D	76	66	10	2			54			2	2	24	40	2	54	7,200		7,200
80	12		D	46	69	23			1	108	300	1	2	5	65	45	8	58	17,550		17,550
81	20		D	54	86	32			1	200	559	2	4	6	80	45	6	60	9,960		9,960
82	36		D	42	78	36			1	160	780	2	4	4	40	49	4	66	10,000		10,000
83	34		D	44	48	4			1	152	600	2	4	2	26	15	4	51	4,485		4,485
84	16		D	44	68	24			1	105	300	1	2	2	15	32	3	50	1,143	7,500	8,645
85	15		D	82	73	9	1		1	126	1,500	5	3	1	8	28	3	58	5,250		5,250
86	30		D	44	68	24			1	84	300	1	2	1	8	15	2	49	1,980		1,980
87	10	W		44	68	24			1	98	135	1	2	1	8	16	2	52	2,600		3,600
88	6	W		48					1	108	270	1	4	1	8	20	2	54	2,000		2,000
89	12		D	28	56	28			2	170,208	330,330	1,1	4,4	6	87	46	2	66	5,700		5,700
90	5		D	45	55	10	1		1	168	390	1	4	1	25½	39	2	67⅓	6,180	1¾ miles	6,180
91	5		D	48	45	3			1	88	132	1	3	1	25	40	3	66	2,910	6,000	8,910
92	3		D	44	50	6	2			50			2	2	30	45	2	50	2,400		2,400
93	3		D	44	50	6	2			50			2	2	20	36	2	50	1,500		1,500
94	6		D	56	40	16	5			56			5	5	50	15	5	60	26,810		26,812
95	24		D	36	54	18	1		1	98	227	1	3	3	20	55	6	60	5,040	2 mi 1 E	15,840
96	2		D	33	50	17	2			40			2	1	10	80	2	40	2,400		2,400
97	12		D	42	56	14	1		1	161	525	2	3	3	30	33	3	64	26,325		26,325
98	½-¼		D	41	52	11			1	160	330	1	4	1	10	65	2	66	600		600
99	¼		D	40	52	12			1	93	330	1	3	1	8	65			200		200

100	8	.....	D	43	56	13	5	.....	.....	63	.....	.....	4	5	65	23	4	63	12,200	.....	12,200
101	8	.....	D	44	54	10	.....	.....	1	147	285	1	4	3	42	45	2	65	7,600	.....	7,600
102	8	.....	D	42	52	10	5	.....	1, 1	•192	60, 120	1, 1	3	5	57	38, 15	5	66	1,500, 11,480	.....	1,500, 11,480
103	8	.....	D	41	57	16	2	.....	1	112	90	1	2	5	57	23	2	64	3,600	.....	3,600
104	8	.....	D	70	62	8	6	.....	.....	64	.....	.....	6	5	57	20	6	64	12,426	.....	12,426
105	8	.....	D	60	52	8	5	.....	1	128	990	1	3	5	43	36	6	66	9,386	7,800	17,186
106	8	.....	D	44	52	8	3	.....	.....	.....	.....	... ..	3	3	43	17	3	66	9,220	3,000	10,220
107	5	.....	D	54	50	6	3	.....	.....	.....	.....	.....	2, 3	5	47	17	3	64	3,300, 2,700	....	6,000
108	4	.....	D	50	54	6	.....	.....	1	176	285	1	4	2	20	65	2	66	2,670	2,640	5,310
109	4	.....	D	51	52	1	.....	.....	1	112	266	1	4	1	16	33	2	67	1,335	.....	1,335
110	5	.....	D	.....	.....	.....	1	.....	.....	.....	....	.....	2	5	52	65	2	64	2,650	....	2,650
111	1–6	.....	D	43	56	13	3	.....	1	176	972	2	4	5	50	46	5	86	16,767	2,600	19,367
112	11	.....	D	42	54	12	.....	.....	2	136	60, 330	4	4	1	30	66	2	66	5,850	....	5,850
113	10	.....	D	•43	56	13	3	.....	1	182	462	4	5	1	30	62½	4	67	11,220	....	11,220
114	32	.....	D	48	62	16	.....	.....	3	176	150, 650, 720	4	11	2	75	55	5	66½	17,979	....	17,979
115	4	W	.....	42	60	18	.....	.....	1	126	225	1	1	1	6	88	2	52	1,200	....	1,200
116	25	.....	D	42	66	24	.....	.....	2	176	960	2	4	3	70	27	35	66	81,840	....	81,840
117	14	.....	D	51	53	2	.....	.....	3	168	810	2	4	3	33	50	6	64	2,200	....	2,200
118	7	.....	D	46	57	11	4	.....	.....	.....	....	.....	4	4	48	15	5	66	15,200	....	15,200
119	7	.....	D	36	56	20	3	.....	.....	.....	....	.....	3	4	48	12	4	66	12,600	....	12,600
120	6	.....	D	40	53	13	5	1	.....	336	250	1	3	3	68	48	3	65	7,150	....	7,150
121	7	W	.....	26	53	27	.....	.....	1	180	480	1	3	5	60	42	9	66	10,440	....	10,440
122	8	.....	D	16	58	42	5	.....	1	168	600	2	3	3	42	43	4	72	1,200, 5,880	....	7,080
123	18	.....	D	.....	...	.....	.....	.....	3	.....	....	.....	.....	.....	.....	....	.....	.....	.....	....	....
124	4	.....	D	18	51	33	.....	1	.. ...	108	300	1	1	1	6	32	2	60	2,400	....	2,400
125	¼	.....	D	18	46	28	1	.....	.....	.....	....	.....	1	1	12	27	2	66	....	....	..... .
126	.....	.....	.....	.....	.....	.....	.....	.....	1	108	300	.....	.....	.....	.....	.....	.....	.....	6,600	....	....
127	13	.....	D	23	50	27	.....	.....	1	78	330	1	3	2	7	42	....	63	4,200	....	4,200
128	8	.....	D	22	53	31	.....	.....	1	184	462	1	4	3	21	65	5	61	Drift, 2,700	....	3,600, 2,700
129	8	.....	D	16	50	34	1	.....	1	184	600	2	3	2	32	45	.....	66	2,520	15,840	18,360
130	¼	.....	D	16	48	32	.....	.....	1	164	420	1	3	2	32	74	2	66	150	....	150
131	12	W	.....	17	46	29	1	.....	1	164	350	1	4	2	32	45	2	66	3,400	....	3,400
132	13	.....	D	16	49	33	.....	1	.....	108	300	.....	2	2	16	80	2	54	4,800	....	4,800
133	¼	.....	D	18	45	27	.....	.....	1	164	225	1	3	1	7	80	.....	.....	.....	10,580	10,580
134	3	.....	D	24	54	30	.....	.....	1	240	360	1	4	3	45	33	3	71	5,250	13,200	18,450
135	8	W	.....	78	52	26	2	.....	.....	.....	....	.....	2	2	28	70	2	66	3,750	....	3,750
136	½	.....	D	19	41	22	.....	1	.....	288	350	1	2	3	68	20	.....	.....	....	10,000	10,000
137	¼	W	.....	17	40	23	.....	1	.....	108	300	1	1	3	49	23	.....	.....	.....	....	..... .
138	16	.....	D	27	51	24	3	.....	1	186	525	1	4	2	39	45	6	66	14,400	....	14,400

TABULATED RESULTS—CONTINUED.

No.	Breasts.				Ventilation and power used.									Engines.		Boilers.			Grates, wire ropes and chains.						
	No. of breasts...	Length in feet ..	Breadth in feet,	Thickn's of pillars	Upcasts.....	Downcasts.....	Section area of do.....	Furnaces	Steam fans.	Fan diameters..	Area of paddles,	Horse power....	Motion of air ...	No. of engines..	Horse power of engines.....	No. of boilers...	Diam. in inches,	Length in feet.	Surface of fire..	Length in feet...	Tons strain	Length in feet ..	Tons strain	Total length in feet	
1	32	218	30	24	1	1	36	...	1	12	96	10	¾	4	590	17	34	494	175	1,200, 1,600	43, 65	....	.....	2, 800	
2	23	180	30	24	1	1	56	...	1	16	180	20	4½	5	620	19	34	484	252	4,600	65	....	.....	4, 600	
3	20	180	30	15	1	1	36	...	1	10	96	10	3½	4	625	9	34	270	117	2,840	43	....	.....	2, 840	
4	17	300	30	24	1	1	52	...	2	10, 10	96, 96	10, 10	5½	5	470	14	34	356	192	2,806	65	....	.....	2, 806	
5	30	180	30	30	2	2	20	...	...	.....	.....	.....	9	1	30	4	30	104	52	1,025	32	....	.....	1, 025	
6	64	240	30	30	1	1	50	...	1	10	72	15	2½	5	225	9	34	225	122	1,900	54	....	.....	1, 900	
7	4	218	30	24	6	6	26	...	1	9	72	6	5¼	5	125	12	34	274	160	550	20	....	.....	550	
8	25	300	33	30	2	2	36	...	2	14, 14	96, 96	10, 10	st'l	8	790	21	30	692	294	3,740	54	....	.....	3, 740	
9	32	285	30	30	4	2	26	...	1	10	72	10	5½	3	145	9	34	279	120	660	35	....	.....	660	
10	12	200	30	24	2	2	20	...	...	.....	.....	.....	.....	4	151	15	34	450	205	2,810	35	....	.....	2, 810	
11	8	60	30	15	1	1	24	...	...	.....	.....	.....	9½	3	135	9	30	234	120	750	43	....	.....	750	
12	30	200	30	24	2	2	20	...	...	.....	.....	.....	4½	1	40	3	30	63	40	....	.....	....	.....	.....	
13	.....	.....	...	...	.....	.....	.....	...	...	.....	.....	.....	.....	2	120	4	30	108	50	450	35	....	.....	450	
14	14	200	30	21	2	2	20	...	...	.....	.....	.....	.....	1	40	3	30	72	40	400	30	....	.....	400	
15	53	300	30	24	3	1	36	...	...	.....	.....	.....	4½	4	270	12	34	360	150	1, 100	54	....	.....	1, 100	
16	23	300	36	24	1	1	36	1	...	.....	.....	.....	13¼	4	110	7	34	222	92	1, 100	54	....	.....	1, 100	
17	44	270	30	24	1	1	36	1	1	12	96	15	4½	3	130	7	34	206	92	2, 420	43	....	.....	2, 420	
18	26	135	30	24	2	2	12	...	1	10	63	6	4½	3	145	7	34	233	90	660	54	....	.....	660	
19	12	185	30	24	2	1	20	...	...	.....	.....	.....	7½	1	20	2	34	61	26	500	35	....	.....	500	
20	.....	.....	.....	.....	2	2	12	...	...	.....	.....	.....	10	1	20	2	34	61	26	....	.....	....	.....	.....	
21	.....	.....	...	24	2	2	20	...	..	.....	.....	.....	.....	1	60	6	34	180	82	720	54	....	.....	720	
22	.....	.....	.....	...	.....	.....	.....	...	...	.....	.....	.....	.....	3	210	8	34	192	108	900	54	....	.....	900	
23	19	200	30	24	2	2	30	1	...	.....	.....	.....	.....	6	675	17	34	510	221	2,000	54	....	.....	2, 000	
24	53	60	30	15	3	3	16	...	...	.....	.....	.....	.....	1	15	2	36	24	26	....	.....	....	.....	.....	
25	24	210	30	24	1	3	30	.	1	10	96	6	4½	6	196	12	34	268	156	3,084	41	....	.....	3, 084	
26	24	200	30	24	1	1	45	...	1	10	96	10	3½	6	260	15	34	450	200	1,830	54	....	.....	1, 830	
27	21	218	30	24	1	1	20	1	...	.....	.....	.....	19	3	110	8	34	172	108	2, 535, 2, 190	28, 41	....	.....	2, 535, 2, 190	
28	16	160	30	24	1	1	36	...	1	12	96	10	5½	3	120	6	34	180	82	1, 200	41	....	.....	1, 200	

29	4	200	30	24	1	1	24	...	...	.....	.....	.....	.....	2	100	6	34	180	82	1,200	41	.....	.....	1,200
30	40	200	30	24	5	5	20	2	...	.....	.....	.....	9½	1	40	6	30	120	82	120	54	.....	.....	120
31	30	180	24	12	1	1	36	...	1	14	108	20	3⅛	7	528	17	34	580	281	856, 1,956	54	.....	.....	2,712
32	24	200	30	21	1	1	36	...	1	14	96	10	2¼	4	175	8	34	288	108	1,270	54	.....	.....	1,270
33	16	200	30	21	1	1	34	...	1	14	96	10	3⅜	8	515	16	34	576	248	2,724	41	.....	.....	2,724
34	12	210	30	24	1	1	34	...	1	14	96	10	4	2	50	6	34	216	72	1,330	41	.....	.....	1,330
35	24	162	30	18	1	1	16	...	...	.....	.....	.....	11½	1	60	3	30	60	38	1,150	35	.....	.....	1,559
36	11	162	30	18	3	2	20	...	...	.....	.....	.....	7	4	240	13	30	390	138	320	20	.....	.....	320
37	.....	.....	.....	18	3	1	20	...	1	12	96	20	3½	1	40	3	34	60	38	320	20	.....	.....	320
38	1	180	30	18	1	1	20	...	...	.....	.....	.....	9½	2	80	6	30	177	78	700	54	.....	.....	700
39	12	186	30	21	1	1	20	...	1	12	96	15	5¼	2	80	8	34	160	108	400	43	.....	.....	400
40	20	210	30	24	1	1	30	...	1	12	72	7	5	2	27	3	34	75	38	.....	.....	.....	.....	.....
41	12	210	34	24	1	1	36	1	1	12	112	15	3½	3	105	7	34	218	94	.....	.....	1,500	42	1,500
42	26	150	27	15	2	2	20	...	...	.....	.....	.....	11⅓	5	325	17	34	468	214	690	54	.....	.....	690
43	12	240	30	18	2	1	30	1	...	.....	.....	.....	5	2	100	6	34	180	76	825	54	1,080	54	1,905
44	26	240	30	18	2	2	30	1	...	.....	.....	.....	4¾	4	450	16	34	488	208	1,096	54	900	54	1,996
45	16	240	30	18	2	2	30	1	...	.....	.....	.....	4⅜	4	160	6	34	204	76	1,200	.....	540, 540	54, 54	2,280
46	30	186	30	21	2	3	20	1	...	.....	.....	.....	9⅛	5	593	23	30	660	300	2,100	54	.....	.....	2,100
47	22	240	24	14	4, 1	3, 2	54, 42	2	...	.....	.....	.....	9	4	160	15	30	440	196	1,650	35	.....	.....	1,650
48	23	200	24	18	1	2	36	...	1	14	96	15	3¼	6	679	17	34	603	230	2,200	35	.....	.....	2,200
49	16	200	30	24	1	1	20	...	...	.....	.....	.....	5⅓	2	100	5	34	180	63	1,690	35	.....	.....	1,690
50	14	135	30	24	6	1	20	1	...	.....	.....	.....	6½	2	40	3	30	60	40	420	20	.....	.....	420
51	10	200	30	16	3	3	24	2	...	.....	.....	.....	7½	5	220	16	30	456	192	2,300	35	.....	.....	2,300
52	9	160	30	16	2	2	16	...	...	.....	.....	.....	6⅔	1	30	2	30	52	38	450	20	.....	.....	420
53	...	.....	.....	.....	.....	...	.....	...	...	.....	.....	.....	19	...	.....	...	...	.....	.....	.....	.....	.....	.....	.....
54	37	240	30	24	5	2	28	...	1	14	144	16	7⅓	6	276	12	34	360	152	650	43	.....	.....	650
55	37	240	36	18	4	2	.....	1	1	14	146	10	6	4	170	10	34	260	130	1,874	43	.....	.....	1,874
56	19	240	30	12	4	.....	16	...	...	.....	.....	.....	19	1	25	2	30	50	26	700	20	.....	.....	700
57	.....	210	30	18	2	....	20	...	...	.....	.....	.....	7¾	2	50	6	30	120	76	1,000	35	250	20	1,250
58	5	165	30	18	5	.....	20	...	.	.....	.....	.....	8½	2	50	3	30	78	38	1,900	35	1,200	20	3,100
59	6	165	30	15	3	.....	16	...	...	.....	.....	.....	11¼	2	100	6	30	156	76	2,000	35	.....	.....	2,000
60	6	180	30	24	5	.....	20	...	1	14	75	10	6½	1	60	6	30	156	78	....	.....	1,000	35	1,000
61	10	180	30	24	5	....	24	1	...	.....	.....	.....	8⅓	2	100	4	34	104	52	1,300	43	... .	.....	1,300
62	6	180	30	24	5	.....	20	...	...	.....	.....	.....	8½	3	145	8	30	222	108	1,874	43	.....	.....	1,874
63	11	60	23	15	1	1	20	...	...	.....	.....	.....	15	1	20	2	30	56	25	....	.....	....	.....	.....
64	8	180	30	15	3	1	16	...	...	.....	.....	.....	3½	2	140	7	30	196	92	800	54	.....	.....	800
65	2	180	30	18	.....	.....	.....	...	...	.....	.....	.....	9	4	320	4	34	120	60	....	.....	1,800	54	1,800
66	...	.....	.....	.....	1	.....	35	...	...	.....	.....	.....	8	4	115	4	34	120	52	....	.....	1,320	54	1,320
67	37	270	30	24	3	2	36	3	...	.....	.....	.....	5½	7	320, 435	15	32	435	192	5,460	35	2,100	54	7,560
68	40	210	30	24	1	1	30	1	...	.....	.....	.....	3⅓	5	190	11	34	372	110	1,800	43	120	42	1,920
69	.....	.....	.....	.....	1	1	56	...	1	14	140	20	3⅔	2	50	5	30	150	62	1,200	43	.....	.....	1,200
70	.....	240	30	18	2	1	30	1	...	.....	.....	.....	13½	2	95	6	30	180	76	1,200	43	.....	.....	1,200
71	36	240	30	24	1	1	36	...	1	11	84	15	3½	4	195	21	30	520	277	3,036	43	.....	.....	3,036

TABULATED RESULTS—CONTINUED.

No.	Breasts.				Ventilation and power used.									Engines.		Boilers.			Grates, wire ropes and chains.					
	No. of breasts..	Length in feet..	Breadth in feet,	Thickn's of pillars	Upcasts	Downcasts.....	Section area of do.	Furnaces	Steam fans.....	Fan diameters..	Area of paddles.	Horse power....	Motion of air ...	No. of engines..	Horse power of engines..	No. of boilers...	Diam. in inches,	Length in feet..	Surface of fire..	Length in feet...	Tons strain	Length in feet..	Tons strain	Total length in feet .. ..
72	.....	.....	.....	24	1	1	56	...	1	14	144	20	.....	5	170	13	34	382	166	3,650	43	.....	.....	3,650
73	.....	.....	.....	...	...	.....	.....	...	...	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	.....	.....	.....
74	.....	.....	.....	24	2	1	30	1	...	.....	.....	.....	$8\frac{1}{16}\frac{5}{16}$	3	135	10	34	243	125	.....	.....	2,220	32	2,220
75	35	225	30	30	2	1	20	1	1	12	96	10	$2\frac{1}{4}$	7	800	19	34	642	257	770	54	.....	.....	770
76	.....	.....	.....	24	2	1	26	1	...	.....	.....	.....	1	3	210	9	36	228	117	3,000	35	.....	.....	3,000
77	29	360	30	24	3	3	30	1	...	.....	.....	.....	$5\frac{1}{16}\frac{1}{16}$	7	343	14	34	470	190	440, 690	35	.....	.....	1,130
78	20	200	30	24	3	1	36	...	1	14	96	20	$1\frac{1}{16}$	9	480	26	34	710	330	1,300, 3,900	54	500	35	5,700
79	12	186	30	21	2	.....	16	1	...	.....	.....	.....	13	1	20	2	34	50	25	.....	.....	.....	.....	.....
80	14	45	31	21	2	1	20	1	...	.....	.....	.....	$22\frac{1}{16}\frac{1}{16}$	4	175	10	30	260	136	900	27	.....	.....	900
81	9	200	30	21	1	1	16	...	1	8	45	6	$23\frac{1}{16}\frac{1}{16}\frac{1}{16}$	6	244	16	36	544	202	1,200	35	.....	.....	1,200
82	21	240	33	24	1	1	30	...	1	14	96	20	$7\frac{1}{16}\frac{1}{16}$	5	236	13	34	380	130	1,800	35	.....	.....	1,800
83	28	270	30	24	2	3	27	1	1	9	72	15	$14\frac{1}{16}\frac{1}{16}\frac{1}{16}$	4	100	8	30	204	108	1,550	27	.....	.....	1,550
84	6	120	30	16	1	1	16	...	...	.....	.....	.....	$6\frac{1}{16}\frac{1}{16}\frac{1}{16}$	2	50	6	30	156	76	540	32	540	35	1,080
85	28	200	36	18	1	1	26	...	1	10	96	30	$9\frac{1}{16}$	5	250	9	30	225	108	.....	.....	3,300	15	3,300
86	18	180	30	18	1	1	20	1	...	.....	.....	.....	9	2	75	7	30	200	86	.....	.....	1,060	15	1,060
87	20	180	28	18	1	1	16	1	...	.....	.....	.....	9	1	30	3	30	100	40	.....	.....	600	15	600
88	12	180	30	16	1	1	16	1	...	.....	.....	.....	.....	2	80	5	30	103	76	900	35	.....	.....	900
89	72	200	36	24	2	2	36	...	1	14	96	20	$6\frac{1}{4}$	5	220	12	30	344	162	860	43	.....	.....	860
90	14	210	30	18	1	1	30	1	1	12	96	15	$\frac{7}{8}\frac{1}{16}$	4	155	11	34	358	148	600, 1,470	$1\frac{1}{4}$, 35	420	20	420, 2,700
91	3	200	30	18	1	1	26	...	...	.....	.....	.....	$7\frac{1}{8}\frac{1}{16}$	3	90	7	30	210	84	930	35	.....	.....	930
92	18	240	30	15	2	1	30	...	...	.....	.....	.....	8	1	15	2	30	40	26	.....	.....	.....	.....	.....
93	4	240	30	15	1	1	24	...	...	.....	.....	.....	8	1	15	2	30	40	25	.....	.....	.....	.....	.....
94	32	200	30	18	8	5	16	...	...	.....	.....	.....	$5\frac{1}{16}$	1	30	3	30	60	38	200	35	.....	.....	200
95	13	210	30	26	3	1	26	...	1	10	96	10	7	3	90	8	30	220	100	560	35	.....	.....	560
96	6	200	30	16	2	1	20	...	...	.....	.....	.....	8	1	15	1	20	12	12	.....	.....	.....	.....	.....
97	10	240	30	21	3	3	40	...	1	12	96	20	3	4	110	7	34	210	91	1,460	35	.....	.....	1,460
98	2	210	30	24	2	1	36	...	1	.....	.....	20	4	4	185	8	34	240	108	.....	.....	1,120	43	1,120
99	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	12	2	50	3	30	60	32	260	35	.....	.....	260

100	28	228	30	20	6	5	20	...	1	10	96	6	13	2	56	4 20	108	38	500	35	.....	.....	500
101	16	200	30	20	2	1	9, 12	1	...	.....	.....	.....	9	2	100	7 36	240	115	700, 6 0	35, 20	.....	.....	1, 300
102	18	210	30	15	5	3	16	...	...	.....	.....	.....	7	3	140	9 34	270	270	150	20	.....	.....	120
103	.....	.....	.....	..	.....	.....	.....	...	...	.....	.....	.....	13	3	95	9 34	270	110	240	20	.....	.....	240
104	12	200	30	15	6	6	20	...	...	.....	.....	.....	9	1	50	3 30	60	36	360	20	.....	.....	360
105	12	200	30	18	6	2	16	...	...	.....	.....	.....	25	3	55	5 30	120	72	3 0	20	.....	.....	360
106	20	210	30	15	5	3	20	...	...	.....	.....	.....	3	1	40	3 34	90	38	2, 240	45	.....	.....	2, 240
107	16	900	30	20	3	2	20	1	...	.....	.....	.....	3½	1	15	2 30	40	26	.....	.....	.....	.....	.....
108	20	200	30	24	2	2	20	2	..	.....	.....	.....	19½	2	125	4 34	140	76	1, 200	54	.....	.....	1, 200
109	20	200	30	16	2	2	26	...	...	.....	.....	.....	22	3	140	6 34	180	38	305, 750	54	.....	.....	305, 750
110	8	180	30	15	2	1	36	1	...	.....	.....	.....	19½	1	15	2 30	48	26	.....	.....	.....	.....	.....
111	30	240	30	24	5	5	56	...	1	14	108	20	2½	7	39⅓	20 34	720	230	5, 887	35	.....	.....	5, 887
112	30	315	36	24	5	2	56	...	1	14	108	10	4	6	470	17 36	5 2	255	1, 000	54	.....	.....	1, 000
113	...	.....	.....	24	6	2	36	...	2	12	192	20	5½	7	220	13 36	400	153	3, 600	43	.....	.....	3, 600
114	22	366	30	24	6	3	36	...	1	12	96	10	5½	7	401	19 36	440	175	3, 560	35	.....	.....	3, 5 0
115	16	200	30	12	2	1	16	...	...	.....	.....	.....	11	3	120	6 34	180	78	550	35	.....	.....	550
116	100	200	30	24	3	1	56	...	1	14	108	20	2½	6	240	13 34	400	187	1, 041, 1, 350	43	900	43	3, 291
117	....	.....	..	24	3	3	30	...	...	.....	.....	.....	8	5	375	20 34	564	228	3, 3 0	35	.....	.....	3, 390
118	32	260	21	21	3	3	16	1	...	.....	.....	.....	5½	1	40	4 34	128	50	900	35	.....	.....	900
119	30	260	21	24	3	3	36	...	1	14	108	20	2¼	3	80	10 30	280	128	600	20	.....	.....	600
120	16	240	34	24	3	3	30	...	1	12	96	10	.....	7	300	15 34	462	231	1, 360	43	.....	.....	1, 360
121	52	220	30	18	9	3	30	...	1	12	96	10	5½	5	236	9 34	276	120	200, 1, 000	43	.....	.....	1, 200
122	30	240	30	18	4	3	24	...	1	14	24	6	13½	4	166	10 34	224	130	1, 400	35	.....	.....	1, 400
123	.....	..	...	.....	.....	.....	.....	...	...	.....	.....	.....	.....	...	.....	...	.....	.....	.....	.....	.....	.....	.....
124	4	48	30	18	1	1	5	...	1	6	10½	6	.....	3	56	4 34	106	48	400	30	.....	.....	400
125	.....	.....	... ..	.....	.....	.....	.....	...	...	.....	.....	.....	.....	1	30	2 30	46	23	.....	.....	.....	.....	.....
126	.....	.....	.....	.....	.....	.....	.....	...	...	.....	.....	.....	.....	...	.....	...	.....	.....	.....	.....	.....	.....	.....
127	....	..	..	24	1	3	35	...	1	12	96	10	4½	5	235	17 34	474	225	3, 600	43	.....	.....	3, 600
128	5	130	30	15	1	1	36	...	1	12	96	10	8	4	125	9 30	255	121	1, 000	43	.....	.....	1, 000
129	.....	.....	.....	16	1	1	33	...	1	8	83	8	5	7	912	13 34	468	169	2, 0 0	54	.....	.....	2. 0 0
130	....	.....	....	....	1	1	36	...	...	.....	.....	.....	9	5	183	10 34	300	126	1, 100	43	.....	.....	1, 100
131	..	.....	...	16	1	1	20	...	...	.....	.....	.....	11	6	310	16 34	450	208	.....	.....	800	43	800
132	13	210	30	16	1	1	16	...	...	.....	.....	.....	19	2	50	3 30	75	38	300	20	.....	20	300
133	....	...	....	....	....	....	.....	...	...	.....	.....	.....	20	2	40	6 34	180	76	800	43	.....	.....	800
134	25	240	30	18	6	1	376	...	1	17	150	20	13	5	300	13 34	390	169	1, 400	35	.....	.....	1, 400
135	12	200	30	16	2	2	16	...	...	.....	.....	.....	5¼	1	40	3 30	90	38	240	20	.....	.....	240
136	.. .	.....	....	....	2	1	76	...	1	20	200	30	.....	5	211	8 30	240	130	800	120	.....	.....	800
137	...	.....	....	...	.....	....	.....	...	...	.....	.....	.....	.....	1	20	2 30	40	23	350	25	.....	.....	350
138	30	240	30	24	4	1	36	...	1	14	96	20	.....	6	260	17 34	5 0	234	4, 452	35	.....	.....	4, 482

TABULATED RESULTS—CONTINUED.

No	Planes inside and outside.					Tracks, T rail, miles, tons and cost.						Per cent. gases.			Shipping, power and force employed.				
	Planes out	Feet long	Do. inside	Feet long	Total length in feet	Outside length in feet	Total length of track laid	Inches gauge	Pounds per yd.	Miles long	Tons per total	Per cent of acid water	Per cent. of fire damp	Per cent. choke damp	Cars shipped in full operation	Do at present	Wagons in use,	Mules in use	Men and boys employed
1			2	1,200	1,200	1,860	49,380	48	25	9 1/3	386 1/4	5	12	6	160	70	70	23	325
2			2	1,287	1,287	2,640	36,960	48	25	7	277 1/4	6	12	6	200	80	60	21	350
3						1,500	3,850	44	25	3 1/8	120	12	12	4	80	40	60	12	200
4	1	550			550	1,000	3,250	44	25	1/8	34	12	25	4	60	40	30	8	225
5	1	550		550	550	1,680	16,980	44	25	3 1/3	130	5	5		120	86	70	29	358
6						800	5,000	44	25	1 1/4	49	3	5		100	80	50	12	212
7	1	200			200	2,500	20,372	48	25	4	159	8	10		120	100	70	16	208
8	1	90			90	6,200	36,994	48, 72	25	7	275	20	25	10	110	80	80	30	400
9					660	10,000	18,137	44	25	3 1/2	137 1/2	10	7	4	150	110	50	25	305
10	1	130			130	1,600	9,949	44	25	1 1/8	74 1/8	8	12	4	120	80	45	15	305
11						1,620	10,260	44	25	1 1/8	74 1/8	10	16	12	40	30	36	10	66
12						4,680	14,250	44	25	2 3/4	119				80	50	60	10	114
13					450	1,270	3,190	44	25	3/4	23 1/3				60	40	60	10	120
14	1	160			160	800	5,025	44	25	1	39				60	40	40	9	110
15						5,475	22,175	48	25	4	158	5	6		100	70	60	16	271
16						5,475	9,825	44	25	1 3/4	69 1/2	5	6		100	70	60	10	71
17			1	120	120	3,000	6,000	44	25	1 1/4	49 1/4	6	6	6	110	100	50	15	240
18					660	860	9,592	48	25	1 3/8	71 1/8	5	5		100	80	70	16	305
19						2,200	6,400	44	25	1 1/4	49 1/4	10		10	60	40	30	9	125
20						500	1,100	44	25	1/4	9 2/3				20	10	12	2	65
21						800	29,600	44	25	5 3/4	227 1/4	8	8	6	60	16	30	5	30
22						350	1,350	48	25	1/4	9 1/3	10	6	6	60		30	6	20
23						2,100	10,280	48	25	2	79	10	6	6	100	60	60	16	325
24						600	3,600	44	25	3/4	28 1/3	6		6	40	20	14	5	53
25	1	450	1	450	900	1,748	7,920	44	25	1 1/2	59 1/4	8	10	6	80	40	33	9	114
26	1	600			600	1,500	5,940	44	25	1 1/8	41 1/4	10	6		80	40	40	10	120
27	1	240	1, 2	75, 180	2,280, 255	960	7,820	44	25	1 1/2	59 1/4	12	12, 20	5, 10	90	60	60	5	100
28					1,200	2,175	12,735	44	25	2 1/2	99	6	12		50	30	80	14	160

29					1,200	2,445	3,690	44	25	$\frac{3}{4}$	$28\frac{1}{3}$				60	40	40	4	60
30						7,325	20,595	48	25	4	$159\frac{1}{4}$			10	120	100	60	27	240
31	1	1,000			1,000	3,501	11,042	48	25	2	$78\frac{1}{2}$	10	20	10	120	100	65	19	254
32						5,000	16,955	48	28	$3\frac{1}{3}$	$128\frac{2}{3}$	6	6	6	80	60	65	10	125
33						17,400	24,844	44	28	$4\frac{3}{4}$	209	10	10		80	60	33	2	149
34						1,000	8,920	44	28	$1\frac{3}{4}$	77	10	10		100	60	100	14	286
35						960	16,350	44	25	3	118	14	10	10	80	45	60	15	150
36						1,950	12,150	44	25	$2\frac{1}{4}$	$88\frac{1}{2}$	10	10	6	70	35	40	10	100
37						600	4,860	44	25	$\frac{3}{4}$	28	5			40	25	20	7	75
38						440	5,795	44	25	$1\frac{1}{4}$	$49\frac{1}{4}$				40	10	14	2	44
39						3,000	13,323	44	25	$2\frac{1}{2}$	99			10	100	80	60	20	172
40						1,050	8,742	44	25	$1\frac{3}{4}$	69			10	100	60	37	13	129
41						1,200	3,240	48	25	$\frac{3}{4}$	29			20	100	35	30	5	51
42						2,000	7,360	44	25	$1\frac{1}{2}$	$58\frac{1}{4}$	12		20	80	40	30	11	110
43						1,000	14,190	48	28	$2\frac{3}{4}$	110	6		6	100	80	40	10	225
44						1,000	7,610	48	28	$1\frac{1}{2}$	66	6		10	100	80	50	10	280
45						1,500	5,415	48	28	1	40	6		10	80	60	30	11	145
46						1,460	44,951	44	25	$8\frac{1}{2}$	$335\frac{1}{2}$	12	20	6	100	65	60	20	150
47						800	13,325	44	25	$2\frac{1}{2}$	99	10	5	10	100	60	70	20	220
48						6,240	18,840	48	25	$3\frac{2}{3}$	$142\frac{2}{3}$	8		15	150	100	75	32	280
49						13,200	23,700	48	25	$4\frac{1}{2}$	$168\frac{1}{8}$	8	16	10	100	40	175	11	45
50	1	300			300	5,000	11,300	48	28	$2\frac{1}{8}$	93	10	16	10	80	60	84	29	182
51	1	600			600	1,500	19,866	48	25	$3\frac{3}{5}$	165	12	14	10	80	14	50	20	200
52	1	200			200	1,500	5,100	40	25	1	39	15		20	30	15	9	3	44
53						1,150	1,750	44	25	$\frac{1}{4}$	9	5				6	5	1	16
54						2,100	16,260	48	25	3	118	12		20	120	80	50	14	225
55	1	100			100	2,100	16,860	48	25	$3\frac{1}{4}$	$128\frac{1}{3}$	5	6	9	100	70	60	14	200
56						720	18,870	48	25	$3\frac{1}{2}$	$138\frac{1}{2}$	12		20	80	50	50	10	96
57	1	250			250	500	8,732	44	25	$1\frac{1}{2}$	$59\frac{1}{4}$	12		10	80			4	60
58						500	10,730	44	25	2	79	10		10	80	25	25	3	40
59						680	18,880	44	25	$3\frac{1}{4}$	$128\frac{1}{3}$	10		10	90	25	30	7	50
60						400	7,000	44	25	$1\frac{1}{4}$	$49\frac{1}{4}$	10		11	60	15	15	4	100
61						600	11,760	44	25	$2\frac{1}{4}$	88	10		12	80	40	25	10	80
62						680	21,860	44	25	4	$158\frac{1}{4}$	10		12	100	70	35	6	120
63						1,650	8,460	44	25	$1\frac{2}{3}$	$51\frac{1}{3}$	5		15	20	12	22	7	56
64						3,621	8,601	44	25	$1\frac{1}{2}$	$59\frac{1}{4}$	5		5	100	65	20	12	260
65						1,200	1,632	48	25	$\frac{1}{4}$	$9\frac{1}{4}$	5		5	80	60	15	3	100
66						645	720	48	25	$\frac{1}{8}$	$4\frac{1}{2}$	5		5	60	12	4		56
67			1	180	180	1,200	48,780	44	25	$9\frac{1}{4}$	$275\frac{3}{4}$	10	26	10	110	50	79	21	159
68						10,000	28,960	48	25	$5\frac{3}{4}$	213	10	16		80	75	96	38	146
69						10,100	12,542	48	25	$2\frac{1}{4}$	89	10	16		100	75	50	23	100
70						1,500	5,910	44	25	$1\frac{1}{8}$	$44\frac{1}{4}$	8		12	60	12	13	6	66
71						4,800	54,951	44	25	$10\frac{1}{3}$	$409\frac{1}{4}$	12	20	10	120	80	96	13	268

TABULATED RESULTS—CONTINUED.

No.	Planes inside and outside.					Tracks, T rail, miles, tons and cost.						Per cent. gases.			Shipping, power and force employed.				
	Planes out.....	Feet long	Do. inside.....	Feet long	Total length in feet.....	Outside length in feet.....	Total length of track laid.....	Inches gauge ...	Pounds per yd..	Miles long	Tons per total..	Per cent of acid water.....	Per cent. of fire damp.....	Per cent. choke damp	Cars shipped in full operation..	Do. at present...	Wagons in use,	Mules in use.....	Men and boys employed.. .....
72	.....	.....	.....	.....	.....	4,950	10,100	44	25	2	*78¼	12	20	10	120	10	30	13	350
73	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3
74	.....	.....	.....	.....	.....	3,750	16,620	48	25	3	118	10	10	10	80	10	16	1	25
75	.....	.....	.....	.....	.....	3,780	9,500	44	25	1¾	69¼	10	6	10	80	25	50	12	225
76	.....	.....	.....	.....	.....	3,000	11,544	44	25	2	79	7	16	6	80	25	45	19	75
77	1	200	.....	.....	200	7,320	43,962	48	25	8¼	326½	7	5	12	100	70	5,75	32	232
78	1	600	.....	.....	600	1,380	30,126	48	25	5¾	227½	8	20	10	200	100	60	5	125
79	.....	.....	.....	.....	.....	2,010	9,2'0	44	25	1¾	69	10	.....	16	60	40	45	8	200
80	1	80	.....	.....	80	1,700	19,250	42	25	3¾	148¼	10	7	10	80	40	50	13	150
81	.....	.....	.....	.....	.....	5,040	15,000	42	25	3	118	9	8	10	100	45	20	5	150
82	.....	.....	.....	.....	.....	560, 1,676	12,236	44	25	2½	98	12	20	16	100	60	50	12	210
83	.....	.....	.....	.....	.....	2,100	6,585	40	25	1¼	49¼	6	13	6	80	60	50	10	125
84	.....	.....	.....	.....	.....	600	1,743	42	25	1⅓	13	10	.....	5	40	15	11	2	42
85	.....	.....	.....	.....	.....	860	6,110	44	25	1⅛	44¼	8	13	.....	80	60	30	13	110
86	1	200	10	.....	.....	600	2,580	44	25	½	19½	12	5	.....	50	30	35	6	100
87	.....	.....	.....	.....	.....	600	3,200	42	25	¾	29⅓	12	5	.....	50	30	20	4	80
88	.....	.....	.....	.....	.....	1,200	3,200	40	25	½	19	12	5	.....	50	30	25	6	80
89	.....	.....	.....	.....	.....	1,500	7,200	44	25	1½	69	4	5	5	135	65	60	16	240
90	1	80	.....	.....	80	1,200	7,380	48	22	1½	49	6	.....	6	130	100	45	11	160
91	.....	.....	.....	.....	.....	5,200	8,110	44	25	1¼	49½	6	.....	6	100	50	50	10	206
92	.....	.....	.....	.....	.....	600	3,000	44	25	¾	15	10	10	10	30	15	20	5	25
93	.....	.....	.....	.....	.....	1 000	2,500	40	25	½	19	8	12	.....	15	10	15	3	20
94	.....	.....	.....	.....	.....	1,800	28,610	48	25	5½	.....	8	12	6	80	50	58	27	158
95	.....	.....	.....	.....	.....	1,100	6,140	44	25	1¼	.....	12	.....	12	60	30	40	10	125
96	.....	.....	.....	.....	.....	100	2,500	40	25	½	.....	6	.....	.....	10	6	6	2	18
97	1	100	.....	.....	100	1,050, 3,950	31,325	44	25	6	.....	5	.....	.....	80	50	45	13	210
98	.....	.....	.....	.....	.....	1,700	2,100	44	25	¾	.....	6	.....	.....	100	10	8	5	43
99	.....	.....	.....	.....	.....	180	380	44	25	1–14	.....	6	.....	.....	.....	2	4	1	15

100	1	240	.....	.....	240	2,400	14,600	48	25	$2\frac{3}{4}$	.....	5	.....	10	100	60	51	19	173
101	1	240	.....	.....	240	7,600	15,200	44	25	3	$118\frac{1}{2}$	10	16	.....	80	50	40	6	125
102	1	100	.....	.....	100	1,200	14,180	44	25	$2\frac{3}{4}$	.....	25	10	.....	110	100	40	16	170
103	1	120	.....	.....	120	26,480	30,080	44	25	$5\frac{3}{4}$	.....	10	.....	10	80	50	45	15	100
104	1	240, 300	.....	.....	300	1,000	13,426	44	25	$2\frac{1}{2}$	.....	6	10	.....	100	80	30	10	110
105	1	300	.....	.....	300	500	9,868	44	25	$1\frac{3}{4}$	.....	7	20	.....	80	50	40	9	100
106	1	150	.....	.....	150	6,600	15,820	44	25	3	$118\frac{1}{2}$	5	5	.....	90	50	47	13	125
107	.....	.....	.....	.....	.....	3,000	9,000	48	25	1	$44\frac{1}{2}$	5	5	.....	60	40	40	12	167
108	.....	80	.....	.....	80	1,100	3,770	48	25	$\frac{3}{4}$	.....	5	.....	5	60	40	26	5	70
109	.....	.....	.....	.....	.....	1,200	2,535	48	25	$1\frac{1}{2}$	$19\frac{1}{2}$	10	.....	.....	60	15	25	4	65
110	.....	.....	.....	.....	.....	700	3,350	44	25	$\frac{3}{4}$	.....	10	.....	10	50	40	19	5	60
111	1	660	1	600	1,200	2,000	18,767	48	28	4	.....	7	.....	10	130	80	76	14	325
112	.....	.....	.....	.....	.....	1,500	7,350	48	25	$1\frac{1}{2}$	.....	8	.....	10	90	80	60	20	222
113	2	1,000	.....	.....	1,820, 1,000	1,200	12,420	48	25	3	.....	7	20	10	100	70	43	25	240
114	1	650	.....	.....	650	12,000	29,979	48	28	$5\frac{3}{4}$	.....	10	10	.....	200	60	60	26	250
115	.....	.....	.....	.....	.....	2,200	3,400	44	25	$\frac{3}{4}$	.....	6	.....	6	30	15	20	4	50
116	1	500	.....	.....	500	10,500	92,460	48	28	$17\frac{1}{2}$	.....	6	6	.....	130	100	150	41	278
117	.....	.....	.....	.....	.....	4,000	6,200	44	25	$1\frac{1}{4}$	.....	10	.....	10	100	20	80	35	225
118	3	300	.....	.....	300	3,480	18,680	44	25	$3\frac{1}{2}$	138	.....	.....	.....	125	50	62	21	180
119	1	250	.....	.....	250	2,400	15,000	48	25	3	118	.....	.....	.....	110	100	66	16	160
120	1	160	1	300	400	2,440	9,500	48	25	$1\frac{3}{4}$	.....	.....	.....	.....	160	60	74	13	200
121	1	160	.....	.....	160	700	11,130	48	25	2	$78\frac{1}{2}$	5	.....	5	120	100	50	20	250
122	.....	.....	.....	.....	.....	2,400	9,480	48	25	$1\frac{3}{4}$	.....	15	5	5	80	50	50	12	200
123	.....	.....	.....	.....	.....	.....	15,600	48	25	3	.....	.....	.....	.....	.....	.....	.....	.....	60
124	.....	.....	.....	.....	.....	1,800	4,200	44	25	$\frac{3}{4}$	.....	12	.....	15	15	10	13	1	80
125	.....	.....	.....	.....	.....	200	200	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	2	60
126	.....	.....	.....	.....	.....	2,000	8,600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	100
127	1	250	.....	.....	250	1,800	6,000	44	25	$1\frac{1}{4}$	.....	12	10	.....	100	20	40	16	120
128	.....	.....	.....	.....	.....	600	3,300	48	25	$\frac{3}{4}$	.....	12	20	.....	56	28	23	6	100
129	.....	.....	.....	.....	.....	2,400	4,920	$58\frac{1}{2}$	25	$1\frac{3}{4}$	$68\frac{1}{2}$	6	10	.....	80	50	35	10	40
130	.....	125	.....	.....	125	2,400	2,550	$56\frac{1}{2}$	25	$\frac{3}{4}$	.....	.....	10	.....	.....	.....	45	6	75
131	.....	.....	.....	.....	.....	800	4,200	$56\frac{1}{2}$	25	$\frac{3}{4}$	.....	10	10	.....	.....	.....	60	1	16
132	1	125	.....	.....	125	2,650	7,450	$56\frac{1}{2}$	25	$1\frac{3}{4}$	.....	10	16	.....	20	15	35	8	65
133	.....	.....	.....	.....	.....	100	100	$56\frac{1}{2}$	25	2	.....	5	.....	5	.....	.....	.....	.....	20
134	1	240	.....	.....	240	2,700	7,970	48	25	2	79	10	.....	5	100	80	50	17	158
135	1	100	.....	.....	100	600	4,350	48	25	$3\frac{1}{2}$	$34\frac{1}{2}$	7	.....	.....	50	30	35	10	80
136	.....	.....	.....	.....	.....	200	200	48	30	.....	.....	5	.....	.....	300	266	100	10	350
137	.....	.....	.....	.....	.....	100	100	44	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	30
138	3	3,640	.....	.....	3,640	5,390	20,790	48	25	4	158	5	7	10	110	100	70	16	320

TABULATED RESULTS—CONTINUED.

No.	Casualties in and out of mines.										General remarks.				
	Killed by coal..	Do. by rock.....	Ditto by falls in shafts, &c.....	Do. by rolls, &c.	Do. by gas.....	Do. by powder,	Total killed.....	Total injured...	Tot'l casualties,	Buildings des'd by fire	Boiler explo'ns,	New collieries open.....	Abandoned collieries.....	Condition of mines.	Safety tracks ...
1	.....	.....	1	1	.....	.....	2	1	3	.....	.....	.....	... .	Favorable.....	3
2	.....	.....	1	.....	.....	1	2	3	5	.....	.....	.....	.....	Do..	2
3	.....	.....	.....	.....	.....	1	1	.....	1	.....	.....	.....	.....	Improving	2
4	.....	.....	.....	.....	.....	.....	.....	7	7	.....	.....	... .	.....	Very favorable.....	1
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	6
6	.....	.....	.....	.....	.....	1	1	.....	1	.....	.....	.....	.....	....	2
7	.....	.....	.....	.....	.....	.....	.....	3	3	.....	.....	.....	.....	....	8
8	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	....	4
9	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	....	2
10	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	....	2
11	.....	.....	1	.....	.....	1	2	.....	2	.....	.....	.....	.....	....	2
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	2
13	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	... .	.....	....	2
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	3
15	2	.....	.....	.....	.....	.....	2	2	4	.....	.....	.....	.....	....	4
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	4
17	3	.....	.....	.....	.....	.....	3	2	5	.....	.....	.....	.....	....	3
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	....	2
19	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	....	1
20	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	... .	.....	....	.....
21	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	....	2
22	.....	.....	.....	.....	.....	.....	.....	... ...	.....	.....	.....	.....	.....	....	2
23	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	....	2
24	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	....	4
25	.....	.....	2	.....	.....	.....	2	... ...	2	.....	.....	.....	.....	....	1
26	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	....	2
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	.....	....	1
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	2

29														
30	1	1					2	2	4					5
31														3
32	1						1	1	2					1
33														2
34														2
35														1
36														1
37														1
38														1
39	1						1	1	2					1
40														1
41													$96,000	2
42			1				1		1					1
43								1	1					1
44														1
45														1
46					1		1	3	4					3
47	2		2	1			5	7	12					2
48						1	1	2	3					2
49								2	2					2
50														4
51														2
52														3
53														
54														5
55	1					1	2		2					3
56														2
57														1
58														1
59														2
60							1		1					1
61														1
62														1
63														2
64				1			1		1					1
65				1			1		1					2
66														1
67								1	1					3
68								2	2					2
69														
70			2				2		2					2
71								3	3					2

TABULATED RESULTS—CONTINUED.

No.	Casualties in and out of mines.										General remarks.				
	Killed by coal..	Do. by rock.....	Ditto by falls in shafts, &c.....	Do. by rolls, &c.	Do. by gas.....	Do. by powder.	Total killed.....	Total injured...	Tot'l casualties.	Buildings des'd by fire	Boiler explo'ns.	New collieries open	Abandoned collieries.....	Condition of mines.	Safety tracks ...
72															2
73															
74															1
75	1		1				2	1	3						2
76															2
77															2
78	1				1			4	5						2
79															2
80								2	2						2
81															1
82	1						1	9	10						2
83							1		1						2
84															1
85								1	1						2
86															2
87															2
88															2
89			2				2	1	3						3
90															2
91															3
92															1
93															1
94															5
95															1
96															2
97								2	2						3
98															2
99															

100	1						1	4	5							6
101								1	1							2
102	1						1	2	3							5
103								1	1							2
104	1						1		1							6
105								1	1							2
106							1		1							5
107																3
108																2
109																1
110																2
111	1						1		1							2
112																3
113						2	2	1	3							2
114																6
115																2
116	1						1		1							6
117																3
118						1			1							3
119							1		1							2
120																3
121																2
122								2	2							4
123								1	1							
124								2	2							
125								1	1							
126								2	2							
127																2
128								5	5							2
129																3
130																1
131																3
132																3
133																2
134																6
135																2
136																2
137																
138																5

I respectfully submit herewith my first annual report of the condition and working state of each mine in the county of Schuylkill, with lists of slopes, shafts and drifts, of lists of the accidents in and about the mines, of the killed, maimed and injured, of maps furnished, and tabulated statements of all collieries as far as was possible for us to examine up to the date of our report, and the actual cost incurred in carrying out the provision of the act of Assembly of April the 12th last past, for that purpose to enable us to carry out our official duties for the year ending December 31, A. D. 1869; all of which is correct to the best of my belief.

JOHN ELTRINGHAM,
Inspector of mines for Schuylkill county.

ATTEST: P. F. M'ANDREWS,
Assistant and Clerk